



TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

MIKA PERHO

FORMING AND DEVELOPING TRIADS IN SUPPLY NETWORK

Master of Science Thesis

Prof. Rainer Breite has been appointed as the examiner at the Council Meeting of the Faculty of Business and Built Environment on December 3rd, 2014.

ABSTRACT

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In this thesis, the interest has been in the subnetwork of three companies and their mutual business relationships, which have been studied in the focal company's supply network. The objective of this research has been to determine conditions for a triad forming and developing from relational properties perspective, and furthermore improve the project coordination and cost efficiency by utilizing the triadic business model in the focal company's supply network. Wanted non-contractual cooperation between suppliers and increase in their self-directedness are also issues that have been addressed.

Relational factors contribute to the easiness of cooperation in the business relationship. Actors' relational easiness and collaborative willingness in triad context were examined by using the case study method. Utilized relational factors trust, commitment, collaboration, relational behavior and power were selected by the conceptual analysis of theory review. The empirical data regarding the relational properties in actors' triadic relationships in five examined triads was collected in interviews with a questionnaire. Twelve interviews were recorded and transcribed, numerical data tabulated, and the whole empirical material analyzed. From the results, opportunities to form and develop collaboration in the triads were derived.

Based on the results of relational measures the actors are willing and able to cooperate in the considered triads in the focal company's project business environment. Promoting and hindering factors for forming and developing triads were also found. Trust and abuse of power are some examples of these factors. The best combination of triad type and its governance mechanism is case-specific. The objectives and business level affect the choice. There is a trade-off situation between self-directedness and controllability. Triad and its management were found to differ in the different business levels and phases of the project. Triads need to be adapted case by case. At the top business level contracts are negotiated and business relationships maintained. Project management level takes care of scheduling and controls that project is on schedule. At the lowest operational level, the actual project implementation is carried out according to the instructions, work orders and conditions.

TIIVISTELMÄ

TAMPEREEN TEKNILLINEN YLIOPISTO

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Tämän tutkimuksen kiinnostuksen kohteena on ollut kolmen yrityksen muodostama toimittajaverkoston osa, jonka keskinäisiä yrityssuhteita, niin kutsuttuja relationaalisia suhteita, on kohdeyrityksen toimittajaverkostossa tutkittu. Tavoitteena on ollut selvittää kolmen yrityksen muodostaman kokonaisuuden toimintaedellytyksiä ja siten lisätä projektinhallinnan tehokkuutta. Näitä tavoitteita vasten on asetettu tutkimuskysymykseksi: Minkälaiset edellytykset on relationaalisten tekijöiden näkökulmasta muodostaa ja kehittää triadeja toimijoiden yhteistyön edistämiseksi ja tehostamiseksi kohdeyrityksen toimittajaverkostossa?

Työssä tarkasteltiin tapaustutkimuksen menetelmällä toimijoiden yhteistyösuhteen sujuvuutta ja triadiyhteistyöhalukkuutta käsiteanalyttisen teoriatarkastelun perusteella valittujen relationaalisten tekijöiden avulla. Hyödynnetyt tekijät olivat: luottamus, sitoutuminen, yhteistoiminta, relationaalinen käyttäytyminen ja valta. Empiirinen aineisto koottiin teemahaastatteluissa, joissa kartoitettiin toimittajaverkostosta valittujen toimijoiden välisiä suhteita perustuen relationaalsiin tekijöihin. Lisäksi triadien muodostamisen ja kehittämisen edellytyksiä arvioitiin analysoitujen kyselymittaustulosten perusteella.

Relationaalisten tekijöiden perusteella toimijoilla on halu ja valmius triadiyhteistyöhön kohdeyrityksen projektiliiketoimintaympäristössä. Triadiyhteistyön muodostamista ja kehittämistä edistäviä ja hidastavia tekijöitä löytyi tutkimuksessa, esimerkkeinä luottamus ja vallan väärinkäyttö. Sopivin triadityyppi ja hallintamekanismiyhdistelmä on tapauskohtainen. Tarkastelutaso ja tavoitteet vaikuttavat valintaan. Triadin itseohjautuvuuden ja hallittavuuden välillä on trade-off -tilanne. Triadin ja sen hallinnan havaittiin eroavan eri tarkastelutasoilla sekä projektin eri vaiheissa. Ylimmällä liiketoimintatasolla neuvotellaan sopimuksista ja ylläpidetään liiketoimintasuhdetta. Projektin hallinnan tasolla aikataulutetaan ja ohjataan pysymään aikatauluissa. Alimmalla operatiivisella tasolla suoritetaan varsinainen projektin aikainen toteutus annettujen ohjeiden, työmääräysten ja olosuhteiden mukaan.

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The empirical part of the study was carried out in a case company. I worked with people in the case company and with people in suppliers to the case company. I want to thank all people who contributed to this study, but for confidentiality reasons, I will not name them. It was pleasure to work with professionals from the many companies involved in this study.

My Industrial Engineering and Management studies including this thesis have taken countless hours to complete. Time spent in my studies has usually meant time taken from something else. I express my heartfelt thanks to my wife Rowena for everything.

In Pori, March 25th, 2015

Mika Perho

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1. INTRODUCTION

New network business models are developed in FIMECC's Rebus research program. The Tampere University of Technology Pori unit is involved in the Rebus research project and this thesis is a part of relational studies to be done during the Rebus project. In this thesis, the business relationships in buyer-supplier-supplier triad are studied. A new method or better way of working especially in non-contractual supplier-supplier relationship is proposed based on the measured states of relational properties in the case triads. Buyer's aim is to utilize network business model better and reduce its own resources involved in controlling, monitoring and inspecting outsourced work which can be done solely by supplier collaboration. In order to get the suppliers to work desirably, suppliers' capabilities, collaboration and self-directedness should be raised to the level that they could cooperate in triad without the continuous need for buyer acting as an intermediary and a supervisor to ensure the solid progress of tasks. Performance improvements, better cooperation, flexibility and cost savings are the objectives of relational business practices development in studied triadic business relationship context. Reduction of involved resources of the buyer should serve the latter objective at least in part. Integrated business development is required in order to realize the winning situation for all parties of triad i.e. the suppliers should also benefit and be taken into account equally in the business practices development. This will help on the way to the long-term relationships and partner network.

This case study was done in project based business in engineering industry. The focal company's supply network consists of about twenty key suppliers and tens of minor suppliers. The study concentrates on a supply network of six key suppliers of the focal company. The case company, focal company, lead company and buyer are the same entity in this study. The term supplier is also used alternatively for subcontractor. Here the buyer has a contract with six suppliers which are studied in five separate triads where buyer and supplier SS are involved in each triad and supplier S1, S2, S3, S4 and S5 in triad T1, T2, T3, T4 and T5 respectively. Supplier SS has supporting and enabling role for co-supplier in each of these triads. Suppliers are in non-contractual relationships with each other.

The current state of relationships is determined by survey done for each actor in considered triads. Answers to the predefined relational questions are analyzed. Based on the survey results the development ideas on relational behavior and activity in the triads are proposed in order to better meet the objectives set by the focal company i.e. in this case study context the buyer in buyer-supplier-supplier relationships.

1.1. Objectives of thesis

The objective of the thesis is to determine the relational conditions for triadic cooperation among parties involved in the case study. Another objective is to identify the relational factors that are likely to enable or hinder triad cooperation. The gap between the current and target states for each relational property is detected from data collected in the survey. Based on the survey results a proposal is given for improving the state of relational properties and activities which can increase the willingness of actors to form well-functioning triads and cooperate better for common good in triad.

Change from the dyadic business model in use at starting point to the triadic business model aims to improve supplier-supplier cooperation and self-directedness in considered triadic business relationships. Additional objective of the case study is to initiate a development framework for better relational business practices by utilizing triads in the focal company's supply network. One objective is to propose some development ideas and options for triads.

1.2. Research problem and questions

The research problem is to find enabling and hindering relational factors for forming and developing a triad and some means to improve the non-contractual supplier-supplier cooperation, self-directedness and mutual synchronization of tasks in the triadic buyer-supplier-supplier relationship in such a way that the buyer can diminish its current monitoring, controlling and intermediary role and reduce related costs.

To find a solution for the research problem the answers to the following research questions are tried to find out in this study.

The main research question (MRQ) is:

MRQ: What are the conditions for forming and developing a triad in the case study context?

Related sub-questions (SRQs) are:

SRQ1: How do the relational factors affect the current relationship of actors involved in the considered buyer-supplier-supplier triads?

SRQ2: What are the challenges and opportunities to form and develop a triad in case study context?

SRQ3: How can the circumstances for triad forming and developing be improved?

SRQ4: How can the considered triads be governed?

Answers to these research questions are based on the results and analysis of the case study survey done to the actors involved in considered triads.

1.3. Focus and structure of thesis

The focus of the study is on the triadic relationship and cooperation and how to make these happen by taking into account and developing relational properties among the selected actors in the case company's supply network.

From theory perspective, the focus is on the relational constructs of triad business relationship. In widely used theoretical paradigms for interorganizational relationships research are the transaction cost economics, resource dependence, strategic choice, stakeholder theory, learning theory, and institutional theory (Barringer & Harrison 2000, p. 369). Figure 1 depicts roughly the focal theory segment (circled area) on the economic-behavioral line of theoretical paradigms on which the case study is set.



Figure 1. Theoretical Foundations of Interorganizational Relationships (Barringer & Harrison 2000, pp. 381-382).

Resource dependence theory focuses exclusively on resources that must be obtained from external sources for an organization in order to survive or prosper. No firm is self-sufficient. It has to interface with its environment to obtain needed resources. How an organization does this, and whether variables such as transaction costs, opportunities for learning, and organizational legitimacy are considered, is left to other theories to decide. The resource dependence theory focuses on the need for critical resources and the necessity for social exchange (Barringer & Harrison 2000, pp. 372-374). Social capital forms in social exchange and requires relationship(s), which can be evaluated by relational properties. These issues are included in the focus areas of the study.

The research framework is depicted in Figure 2, which illustrates the elements the study consists of as selected means and tools to get and analyze the research results for the substance of circumstances for triad forming and developing.

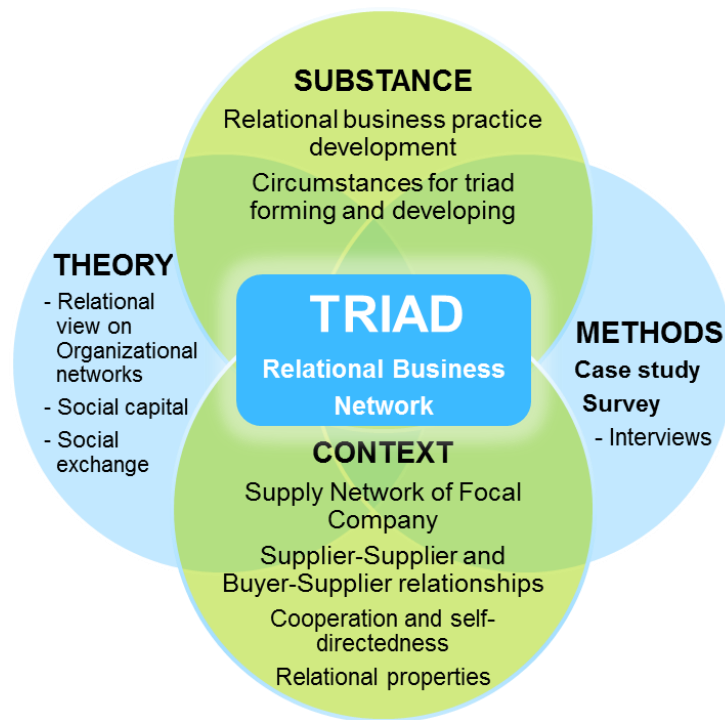


Figure 2. Research framework.

The research method is case study in this thesis. Triad forming and developing is examined in supply network context. Buyer-supplier and supplier-supplier relationships are evaluated as part of considered buyer-supplier-supplier triad. Assessment of the relational condition and properties of triadic cooperation is done by the survey in which the state of relational properties in considered relationships are detected by interviewing people from companies involved in the case study. The current state and target state of relational properties are recognized by the interviews. Also willingness to increase self-directedness in cooperation is asked as a possible mean to reduce the need for triad governance in part. Relational properties, as part of social capital and potential aids in social exchange, have impact on triad practices and governance mechanism as well. The importance of relational properties is emphasized as being a part of social capital, a possible competitive advantage, in use for establishing and utilizing close social relationships in business network for example in acquiring the necessary resources. How to get companies with necessary resources work together in the best possible way. This is studied in triad context. The opportunities and challenges in forming and developing triads are estimated based on the empirical results from the survey and findings in literature.

The case study is delimited to the business triads, relationships and actors that are aiming for a long-term business relationship. Contractual issues are not taken into account in detail in this study. The focus of the survey is on evaluations of relational properties, finding preconditions for cooperation and issues for and against triadic

cooperation. Eventually, the evaluation of the state for triad forming and developing in buyer-supplier-supplier relationship from relational properties perspective is derived from the survey results.

The structure of the thesis is as follows. First, the theories utilized in the case study are presented. Theories of supply network, triad and relationship are presented in Chapter 2. Theory of relational properties and how these are part of larger theory context of social capital and social exchange are presented in Chapter 3. Second, the research methodology and material, the case study and survey, are presented in Chapter 4. Third, the empirical research results are presented in Chapter 5. Then finally the conclusions and discussion parts are followed in Chapter 6.

2. SUPPLY NETWORK

In this study, the supply network is researched based on the relational perspective and evaluation of relational properties in the triadic relationships of supply network companies. Network structure, its building blocks and used network model are introduced. Network relationships are characterized by the type of structure, the roles of actors, strength, duration and quality. Relationships' interconnectedness in network is also addressed. Theories in research framework should provide elements which help an actor and its relationships evolve by taking other involved actors and relationships into account and become a positive actor in a supply network, and eventually an actor in the supply network of partner relationships.

There is no relationship or business and therefore neither business relationship in isolation. A relationship is needed between two business units in order to form a business relation. In the business relationship the parties are able to exchange information, knowledge, resources, services and products. The simplest relationship is dyadic in which two actors have a relation – a two-party relationship (dyad). Companies are not monogamous i.e. have only one relationship with one other organization. Companies are part of a network of relationships (Ritter 2000, pp. 317-326). Interorganizational relationships are many from suppliers to customers and financial, shareholding to regulating institutions among others that form business network.

Network is a structure where number of nodes are related to each other by specific links. In business network the nodes are business units such as suppliers, producers, service companies and customers. The links are the relationships between the business units. Each business unit and relationship has unique content in business network. Business unit consists of human, technical and physical resources bound together. A relationship is a 'quasi-organization', which arises from the investment of human and physical resources by both companies. Business network is the result of complex interactions between and within companies in relationships over time. (Ford et al. 2003, p. 18)

Supply network is a network of connected and interdependent organizations mutually and cooperatively working together to control, manage and improve the flow of material and information from suppliers to the end product that eventually create value to the end customer. Organizations in supply network are involved in the different processes and activities that produce value in the form of products and services. (Lysons & Farrington 2006, p. 91-93) Firms are engaged in manufacturing and assembly of parts to create a finished product in supply network (Choi & Hong 2002, p. 469). Supply networks

considers complex relational patterns beyond the sphere of responsibility of a single firm where the relationships are governed by formal contracts as well as informal social ties (Choi & Dooley 2009). Supply networks are complex adaptive systems where firms together and independently try to fulfill demand and respond to changes in the environment and actions of counterparties (Pathak et al. 2007). The interaction with counterparties can be competitive or cooperative in nature.

Supply network can be seen as an instance of a business network, which is depicted in Figure 3.

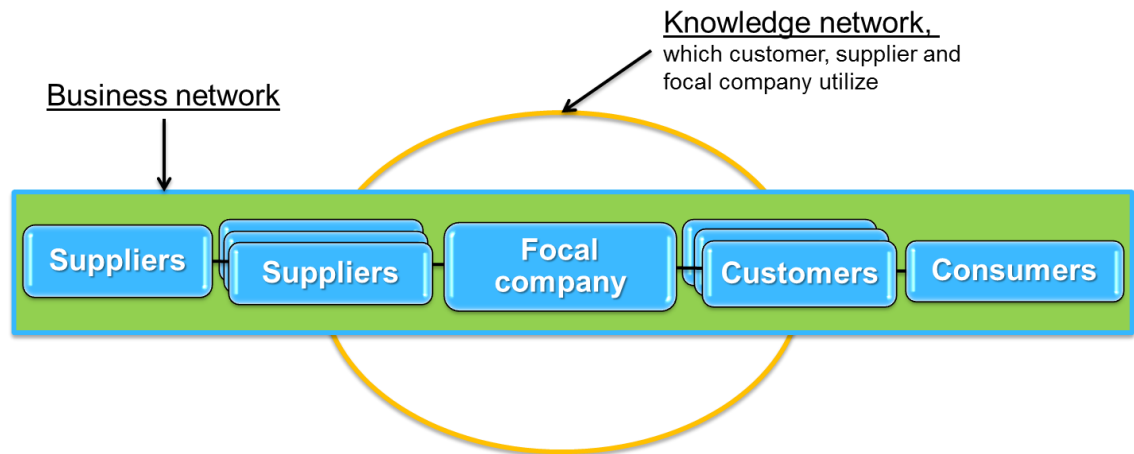


Figure 3. Business network. (Hansen et al. 1998)

Networked parties have common interests to utilize each other's resources by different activities in value creation processes. Supply network connects actors and their knowledge, abilities and skills to form a value network which refines products and services into added value items and services for end users as value adders in their purposes.

2.1. Network connections

A network model that is used as reference in this study is ARA model (see Figure 4). The actors, resources and activities (ARA) model (Håkansson & Johanson 1992) was a major step forward in conceptualizing business-to-business (B2B) relationships and networks. ARA model suggested mechanisms by which the entities relate to one another (see Figure 4). It proposed that three entities, actors, resources and activities captured the key aspects of interfirm (B2B) relationships and also within firms at all levels down to the relationships among individuals. Actors perform activities and control resources usually in combination with other actors. Actors are goal oriented and act to reach their goals which are transformed into more specific intentions. The value is created through the activities by which actors transform and transfer resources with a view to maintain and grow the more aggregated actor. Actors can be individuals or collectivities such as

groups, departments, organizations, or network of organizations. Resources can be tangible or intangible, stable or unstable, valuable or worthless depending on their configuration in the context. Activities can be of any kind and can take place at any level from the individual to the organizational networks. Actors have control over some resources and access to others resources to work with other actors to create, combine, develop, exchange, or destroy resources. (Lenney & Easton 2009)

An activity can be transactional or relational. The activities can be seen from transaction cost economics (TCE) perspective in which the idea is to find a governance structure that generates the lowest transaction cost of running the system under specific and formal contracts. Relational activities, as social exchange, on the other hand are not specified as obligations, but rely on the idea that when one does another a favor, it will be rewarded in the future. A relational property trust for example is a key element in social capital (SC) and social exchange theory (SET) for the successful relational relationship. (Mäenpää 2013, pp. 53-57)

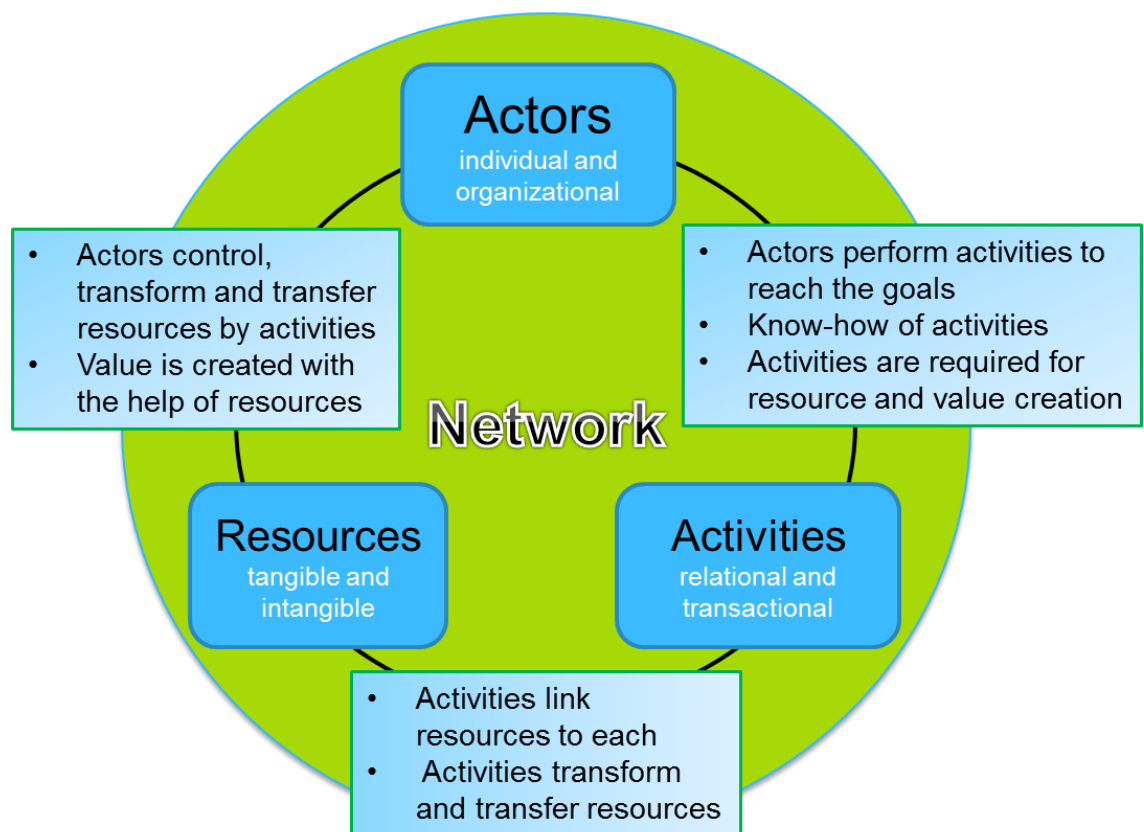


Figure 4. ARA model (modified from Håkansson & Johanson 1992).

According to Håkansson and Snehota (1995) the substance of a business relationship is easier to understand by looking at three aspects of it: actor bonds, resource ties and activity links. Refined ARA model introduced the concept of substance layers which binds together three original entities into actor bonds, resource ties and activity links.

Activity links as interlocking of behaviors provide the backbone of any organization or interorganizational relationships. Actors can be linked in many different ways and usually the intention is to set up pathways so that efficient operations are enabled in the network. Activity links may encompass many operational aspects such as design, production and logistics between two companies. Activity links develop over time and with repeated transactions. *Resource ties* connect various resource elements and can be entirely material as in the case of a production line consisting of a series of machines or entirely immaterial as in the case of the combinations of human knowledge and skills that result in the creation of a new product design. The mutual adaptation of resources forms resource ties between the companies in a relationship. *Actor bonds* connect actors and thus are primarily social in nature and involve perceptions, social cognitions, identity and affect. Bonds are created, nurtured and sometimes destroyed through interaction with other actors in the network. (Lenney & Easton 2009, pp. 553-554; Ford et al. 2003, pp. 39-40)

Actors' bond starts to build up from the first contact between them. In the beginning, there is considerable distance between actors in number of dimensions. *Social distance* measures the extent of actors' unfamiliarity in other's way of thinking, working and being at easy with. The degree to which the norms and values of two companies differ is measured by *cultural distance*. The difference and suitability between products, services and production technologies between the companies are measured with *technological distance* measure. *Time distance* refers to the fact that the business under discussion may actually take place far in the future (Lenney & Easton 2009, pp. 553-554; Ford et al. 2003, pp. 39-40)

Interactions and activities are often complex, interdependent, interactive and continuously evolving to adjust to the changing environment, resulting in a network of relationships. Two-way communication is essential in enabling actors to become aware of each other and learn each other about what they stand for, what they expect from the relationship and what they can offer to it. Relationships vary depending on the actors need, willingness and ability to learn. It is long-term learning process to get to know counterpart about what they mean by things they say and the attitudes they show. (Ford et al. 2003, p. 39) Interactions between actors lead to the formation of relational assets and social attachment. This also has effect on the assessed values of relational properties of relationship.

Structural capital is the configuration of linkages between people and business units (Nahapiet & Ghoshal 1998, p. 244). From the strategic network perspective, the firms with superior network structures, such as the central position (Wasserman & Faust 1994) and structural holes (Burt 1992), exercise significant influence on access to resources, information, social capital brokerage and are well positioned to be aware of

changes in business environment and thus able to respond quickly (Zaheer & Bell 2005; Gulati et al. 2000).

Value, capabilities and key resources are rarely created within one company, but co-created among supply network actors based on competitive and collaborative relationships (Dyer & Singh 1998). Network as organizational form uses flexible, dynamic communication linkages to connect multiple organizations and people into new entities that can create products or services (Contractor et al. 2014).

In order to take complex dynamics of relational networks into account one must look at beyond the traditional dyadic context. Olsen and Ellram (1997) proposed to focus more on network context relational dynamics studies of buyer-supplier-supplier triad.

2.2. Network and triad connections

Supply network consists of dyadic relationships. In order to capture the essence of a network the focus should be moved from dyad to triad as a unit of analysis. Dyadic ties are embedded in a triad. Triad perceives effects beyond dyadic relationships.

A *dyad* consists of two nodes and a connecting link between the nodes. An example of a dyad is buyer-supplier relationship (see Figure 5).



Figure 5. A buyer-supplier dyad.

In dyad, the main focus is on relationship (link) and how does it affect both connected business units (nodes).

In Figure 6, the dyadic relationships of supply network are depicted. The focal company has received an order from its customer C or O.

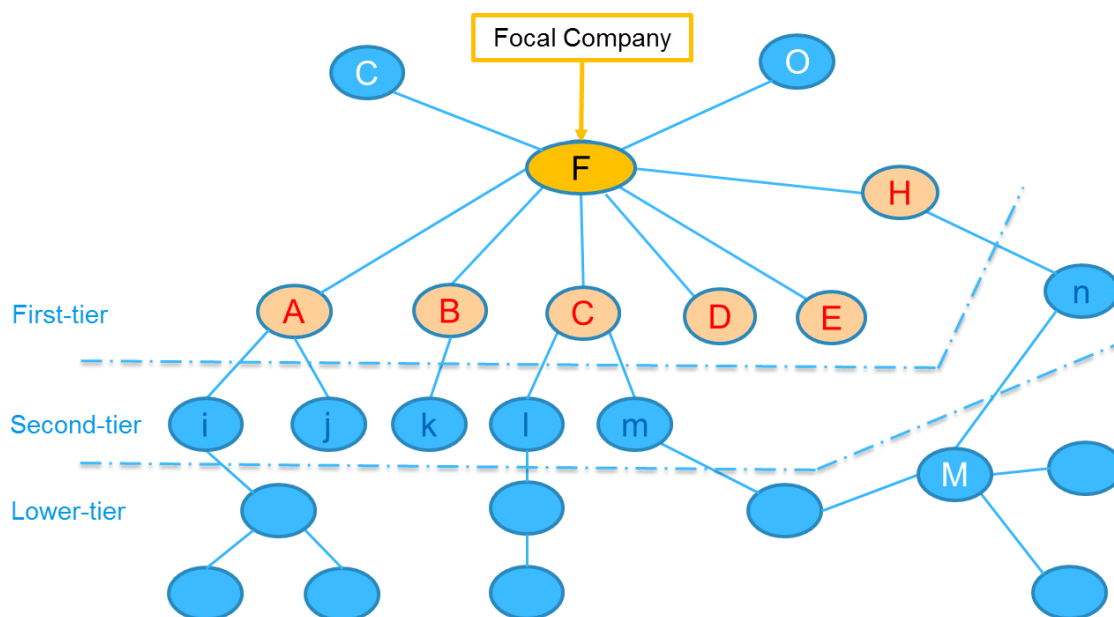


Figure 6. Dyads in a supply network.

As depicted in Figure 6, it is a common case in supply network that focal company (F) has many separate contractual dyadic relationships with its suppliers which are not cooperating with each other. Focal company as a customer delegates authority to the selected key suppliers (A, B, C, D, E and H) which become known as the direct first-tier suppliers in supply network (Cousins et al. 2008, p. 54). The focal company also has indirect so called second-tier suppliers (i, j, k, l, m and n) in the supply network. A first-tier supplier is also the supplier that has a significant technical influence on the assembly even supplying indirectly (e.g. supplier n in Figure 6). In addition the focal company can have lower-tier (3rd, 4th, etc.) suppliers. (Lysons & Farrington 2006, p. 139) Middleman M is one of them. Companies are bounded by contracts and linked operationally across multiple tiers in a supply network (Pathak et al. 2014, p. 254). The input-transformation-output processes of supply network are run by the operations of supply network. The value creation and supplementary tasks are performed to produce ordered semi-fabricated products and to enable the final assembly of the end product, which as the final output is delivered to the customer. After all, the network level objective has been achieved.

The companies continuously strive to achieve superior network positions. The network position dictates the access to the resources and makes the competitive advantage possible. (Madhavan et al. 2004, p. 921) To utilize opportunities and potential of business network an organization must act and cooperate in multiple relationships. In dyadic relationship consideration of external effects that come from wider business

network in which the dyad belongs to are excluded (Choi & Wu 2009, pp. 263-264). In addition the dyadic ties tend to be person to person or interpersonal. If disrupted, dyadic ties are difficult to restore because the offending issues are easily personalized. Idiosyncratic tendencies of individuals increase the risk of over boiling incidents, unpredictability and uncontrollability in work community. (Yoon et al. 2013, pp. 1457-1465)

A dyad makes no reference to how a link may affect another link, or a node affects multiple links that exist in a business unit's sphere of influence. In order to take these effects into account a more sophisticated building block of a network is required. (Choi & Wu 2009, p. 10) Figuring out how a node and its links affect another link between neighbor nodes, a triad is required as the unit of analyses.

A *triad* consists of three nodes and the possible ties between them (Madhavan et al. 2004, p. 920). The triad is a core structure of higher-order networks (Wasserman & Faust 1994). An example of a triad is buyer-supplier-supplier relationship (see Figure 7).

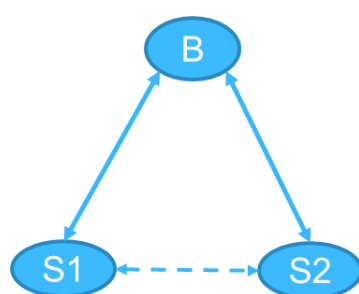


Figure 7. A buyer-supplier-supplier triad.

In buyer-supplier-supplier relationship buyer's relationships have influence on the supplier-supplier relationship and vice versa. This indirect effect is not usually taken into account in dyadic analysis, in which the main focus is on how a node affect another node. The fact that the firms are embedded in a larger network is omitted in a dyadic framework. It focuses on the relations specific to a pair of firms. Ironically, a dyadic framework cannot fully account for the relational behaviors of the two firms involved in the dyad. The resource dependency between the firms may easily vary by the resource availability of the third firm for instance. Additionally, more than two firms are needed in order to understand how firms behave in a network. The object under scrutiny needs to be changed from dyad to triad for the network analysis purposes and to interpret the relational behavior of a firm more fully. For example, a triadic buyer-supplier-supplier relationship consideration will be imperative in order to understand the complex relationship interactions in supply networks. (Choi & Wu 2009b, p.10)

When buyer-supplier and supplier-supplier dyads are considered in isolation, they can be seen as two companies dealing only with one another. However, when the companies are brought together into a triad, each begins to see entirely different relational dynamics and meaning of dyadic engagement within the triad. In Figure 8, a few possible triadic relationships of the example focal company are depicted.

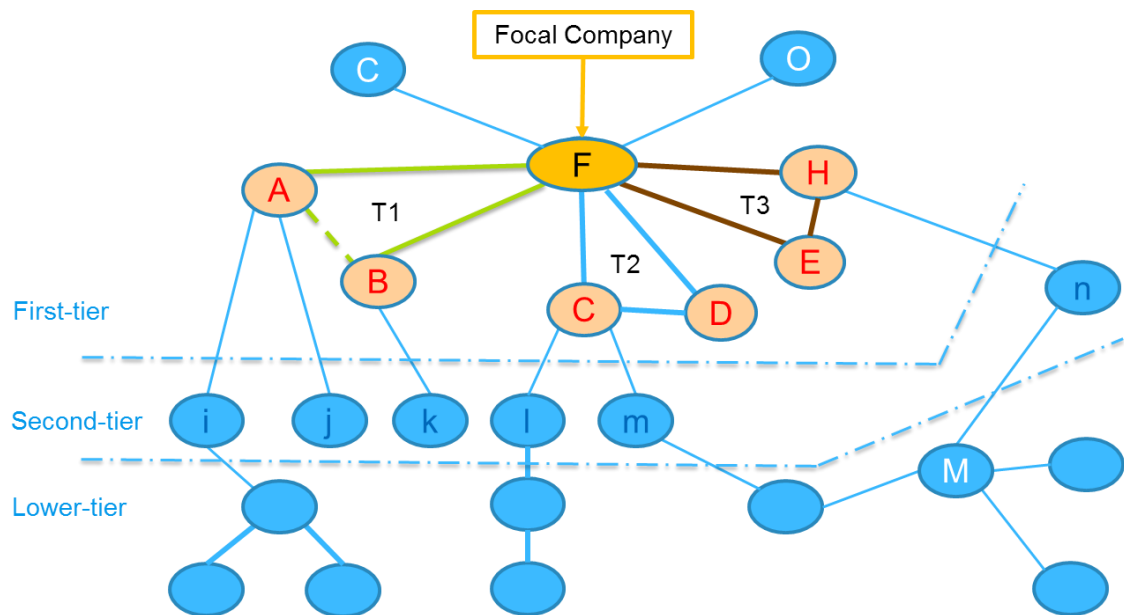


Figure 8. Triads of focal company in a supply network.

Here the focal company has triads T1 (FAB), T2 (FCD) and T3 (FEH).

Suppliers A and B have non-contractual (loose/voluntary) relationship to mutual cooperation for triad's good. The cooperation between suppliers in triad T1 may require some sort of contractual agreement (as in the cases T2 and T3) or something a like to start with in order to get suppliers A and B to cooperate. A triad can facilitate and make the cooperation of its actors more efficient with the help of good governance.

The triadic relationship and cooperation will certainly bring about benefits as well as challenges. It is more a network like collaboration with more possibilities and few optional configurations. Some of these issues of triad collected from literature are listed in the following Table 1.

Table 1. Effects that usually result from triadic relationship.

<i>Type of</i>	<i>Effect</i>	<i>Author</i>
Behavioral	<i>Generates less variability of behavior than dyads</i>	<i>Yoon et al. (2013)</i>
	<i>Generates behavioral convergences</i>	
	<i>Generates more uniformity and convergence in exchange behavior</i>	
	<i>Tend to constrain emotions</i>	
	<i>Positive emotion or affect has a stronger impact on cohesion in dyads</i>	
	<i>Reduce individuality</i>	
	<i>Has higher levels of cohesion in the context of repeated exchange</i>	
	<i>Greater sense of cohesion</i>	
	<i>Uncertainty reduction has a stronger impact on cohesion in triads</i>	
	<i>Exclusion introduces competition or conflict which may dampen the relational ties</i>	
Structural	<i>Adds sense of community</i>	<i>Kohtamäki (2005)</i>
	<i>Increases complexity</i>	<i>Choi & Wu (2003)</i>
	<i>Social interaction among the actors is interlinked, i.e. the higher the interaction between A and B, the lower between the B and C</i>	<i>Havila et al.(2004)</i>
	<i>Not that easy to exchange ideas than in dyad</i>	<i>Cousins et al. (2008)</i>
	<i>Greater capacity to generate order and cohesion</i>	<i>Yoon et al. (2013)</i>
Resources	<i>Can reduce resource and informational asymmetry between and among the actors</i>	<i>Madhavan et al.(2004)</i>
	<i>Gain access to a particular resource</i>	<i>Chi (1994)</i>
	<i>Transitive triad aims to create value for all three partners</i>	<i>Madhavan et al.(2004)</i>
Economic	<i>Less cost transparency</i>	<i>Cousins et al. (2008)</i>
	<i>Risk and cost sharing</i>	<i>Bartholomew (1997)</i>

In theorizing buyer-supplier-supplier relationships Choi and Wu (2009b) applied the balance theory from behavioral psychology, to evaluate the balance state of the actors whether two nodes have a positive, cooperative relationship or a negative, adversarial relationship. Typically, a plus (+) sign indicates a cooperative, voting power based relationship between two actors who are predicated on mutual trust and commitment (Krackhardt 1992; Morgan & Hunt 1994). A minus (-) sign indicates an adversarial, exit-based relationship that is caused by inequity and distrust between two actors (Johnston et al. 2004). Figure 9 depicts two examples of the balance states of triad.

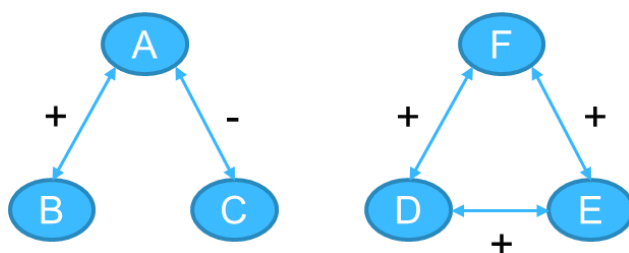


Figure 9. Balance state of triad ABC is indeterminate due to structural hole, whereas the triad DEF is in balance state.

The undefined balance state of ABC triad could possibly be resolved and change to a balance state as in triad DEF by developing relational properties of the relationships. The overall characteristics of a dyad relationship are described either positive or

negative by plus (+) or minus (-) sign respectively. According to the balance theory, a balanced triadic relationship always has three plus signs or two minus signs and one plus sign. An unbalanced triadic relationship always has two plus signs and one minus sign or three minus signs. In an unbalanced triad actors try to address and resolve the relational inequity or mistrust until the triad is balanced. (Choi & Wu 2009b, p. 11) There are three balanced and three unbalanced triadic relationships. A balanced state offers a stable relational structure for the members of business units in the triad.

Parties aiming for good cooperation usually pursue the high level of order and cohesion, uncertainty reduction, informational symmetry, conflict resolution and trust. All these are uneasy to implement in unbalanced triad. According to the balance theory individual actors in an unbalanced triad would try to address the relational inequity or mistrust that causes the unbalance in the triad until it is resolved and the triad becomes balanced. Therefore, as a general statement, an unbalanced triadic relationship tends to transform into a balanced state and the new relationship arrangement is often created sequentially (Heider et al. 1958). This characteristic predicts the relationship formation patterns and the nature of the new relationships. For example, in a three-firm triad ABC, it is likely that firms B and C become allies when they both already have a positive relationship with A (see Figure 9). In this case it is said that the positive relational position is 'transitive' – B and C become allies based on the strength of their positive relationship with A (Heider et al. 1958; Choi & Wu 2009b, p. 11). Cf. transforming balance states in ABC to states as in DEF in Figure 9.

A special type of triad occurs frequently in the supply network, wherein a buyer keeps suppliers apart in order to engage them in competition. In this unique triad, two nodes (e.g., two suppliers) are not connected directly, but indirectly through a third node (e.g., the buyer). This triadic arrangement is referred to as a *structural hole* (Burt 1992). In Figure 9 triad ABC depicts a structural hole. In such a triad, the structural hole between two disconnected nodes does not mean that the disconnected nodes are unaware of each other. It simply means that each of two nodes focuses on its own activities and it does not attend to the activities of the other. Actors on either side of a structural hole circulate in different flows of information. Structural holes are thus an opportunity for a broker to control the flow of information between actors and the projects that bring together actors from the opposite sides of the structural hole. (Burt 2000, p. 353)

The missing direct link may indicate relational tension and competition between two actors (Choi et al. 2002). The state of a structural hole is neither balanced nor unbalanced (Wasserman and Faust 1994, p. 227). In a structural hole triad arrangement, the balance state is indeterminate. Certain tension is created in the structural hole arrangement and it is up to the members whether they have found equity and balance or not (Choi & Wu 2009b, pp. 11 - 13).

The power of actors in triad may differ. The stronger actor can control a weaker actor. Actors aspire to the leading position in order to be able to control two others. However, the strength of a triad is equal to the strength of the weakest actor. (Caplow 1968, p. 3)

George Simmel (1950), a philosopher and sociologist, illustrated the underlying difference between a dyad and a triad by an example of a marriage relationship. When a man and a woman become a couple, they establish a dyadic relationship. Just when they feel they have established equilibrium in living together, a baby arrives. Each person in the man-woman dyad now has a new relationship with the baby, which affects and changes the relationship dynamics in the dyad between the man and the woman. Subsequent studies that were built on Simmel's work pointed out that going from a dyad to a triad entails a quantum change.

According to Madhavan et al. (2004) the firms engage in triadic ties for both competitive and cooperative reasons. To separate these distinct motives, they proposed the following constructs. *Countering*, which takes the competitive motive into account, is a formation of triads with the goal of reducing the value appropriated by a competitor. *Clustering*, which takes the cooperative motive into account, is the formation of triads with the goal of combining resources from multiple actors. Clustering is value-adder for all actors, whereas countering limits value creation while trying to nullify the extra value of appropriated by an actor.

2.2.1. Types of triad

Triad can be characterized by the type of triad structure, the roles of actors, the strength of relationships between actors and time period for the expected existence. Typically there is a focal actor having the central role in triad. In a triad structure focal actor can be located into a structural hole when it forms a bridge between two other disconnected actors, see Type I triad in Figure 10.

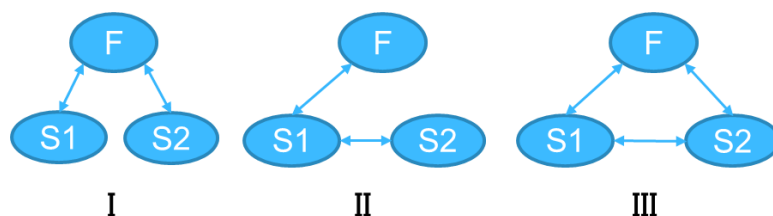


Figure 10. Triad structure types I, II and III (Peng et al. 2010).

In Type II triad, the focal actor is in a peripheral position in triad where it is connected to one of the two other interconnected actors. In balanced structure, the focal actor is closest to be equal with the others. This Type III triad is called transitive or unitary

triad. (Peng et al. 2010, p. 400) Focal company has the bridge role in Type I, the peripheral role in Type II and the fully connected role in Type III triad (see Figure 10).

In a *transitive triad* (type III) each actor has a direct link to the other two actors. Business units can form a transitive triad either as separate bipartite ties between each with no shared administrative structure in alliances or a three-way alliance with a shared administrative structure such as a consortium. (Madhavan et al. 2004, pp. 918-920)

In *unitary triad* every actor interacts with each other actors in about the same extent (see Figure 11). Each actor acts as an intermediating actor between the other two actors. Strength of the relationships and number of the contacts in the relationship are fairly equal.

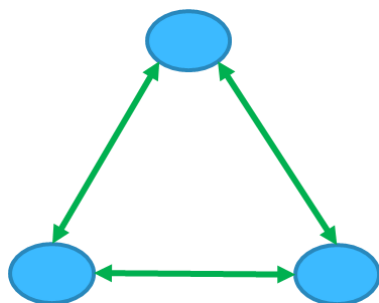


Figure 11. Unitary triad.

Each relationship has an influence on other relationships in triad. Actors have tendency to maintain the group as cooperating unit to achieve the common goals. (Holma 2009, p. 33)

In *serial triad* the intermediating actor establishes two dyadic business relationships to the other two actors one by one (see Figure 12). The dyadic exchange has an influence on the other dyad.

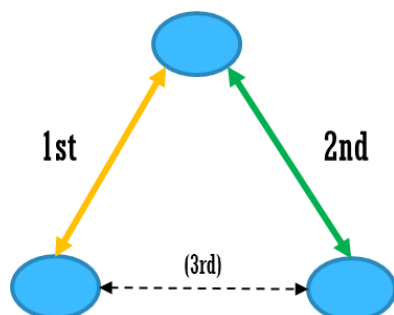


Figure 12. Serial triad.

There is loose or no connection at all between the peripheral actors. Intermediating actor has control over the serial triad and tasks, which are performed in predetermined order.

Intermediator's position is defined in relation to the other two actors. (Holma 2009, pp. 33-34)

There is no direct connection between the peripheral actors in *bridge triad* (see Figure 13). The third actor plays the role of a broker and such an arrangement is referred to as a structural hole (Burt 1992).



Figure 13. Bridge triad.

The intermediary and its tasks may bind the network actors together or provide a barrier between an actor and a network. (Holma 2009, pp. 34-35)

Trimarchi (2001) introduced the *plural triad* in which the business actors from different culture are involved in both relational and exchange relationships.

Actors of *terminal triad* prefer to operate independently, they do not cooperate voluntarily. In terminal triad, actors are aware of the fact that the triadic relationship has continuity in the future as has been in the past. The continuity is not necessarily related to actors' wishes for the future. (Holma 2009, p. 35)

Actors in *continuous triad* are related to each other for the time being defined by contractual terms or duration of the project for instance. Adaptation from actors is normally required to the certain extent in long-term triadic relationship. (Holma 2009, p. 35)

Episodic triad is established for a certain purpose and time period and dissolved at the end of it. Previous interactions affect the interactions during the episode and both affect the future interactions. (Holma 2009, p. 35)

2.2.2. Triads in interfirm networks

Triads can be formed in multiple ways and configurations. There is not a solution that fits all purposes. Forming triads is the subject of purpose and environment it belongs to. All triads are unique as all relations are. A certain type of triad fits better to a specific situation. The best triads are formed by the actors themselves based on the common view and needs. In interfirm network triads are not independent of each other (Wasserman & Pattison 1996; Madhavan et al. 2004, p 923). See next Section 2.2.3 for more about interconnectedness of relationships.

In the business networks a very common structure of triad is a buyer-supplier-supplier relationship where suppliers are not in a direct relationship with each other. As stated before, the triadic structure in which two nodes are not connected directly is referred to as the structural hole (Choi & Wu 2009b, pp. 11 - 15). A company in a structural hole position does not gain value by mediating subcontractors' transactions (Uzzi & Gillespie 2002, p. 596). In such a case, it makes sense to consider about transforming from the bridge triad into a triad in which subcontractors have direct link to each other. However, as Wasserman and Faust (1994, p. 598) noted that not all relations for all sets of actors have transitive tendencies. In fact, economic relations among business units as political relations among individuals in a large bureaucracy can certainly be intransitive rather than transitive. Sometimes it requires quite much effort and some replacement(s) perhaps before optimal triad has been formed.

Geographic proximity is a significant factor in triad formation. Firms tend to form transitive triadic alliances with firms that belong to the same technology group (Madhavan et al. 2004, p 924). It is natural that certain cohesion among actors is required in forming a triad. This cohesion can be based on technology compatibility, long-term relationship, trust and other relational properties.

2.2.3. Interconnectedness of relationships

According to Håkansson and Snehota (2002) "every relationship is not only a bridge between two actors but also a reflector or a projection of other relationships." Relationships may have an effect on other relationships in the network. This indirect, secondary or network function of relationships is called interconnectedness and it adds another dimension for analyzing relationships in business network. Interconnectedness is bidirectional by effect. The relationship AB has an effect on the relationship AC and vice versa (see Figure 14).

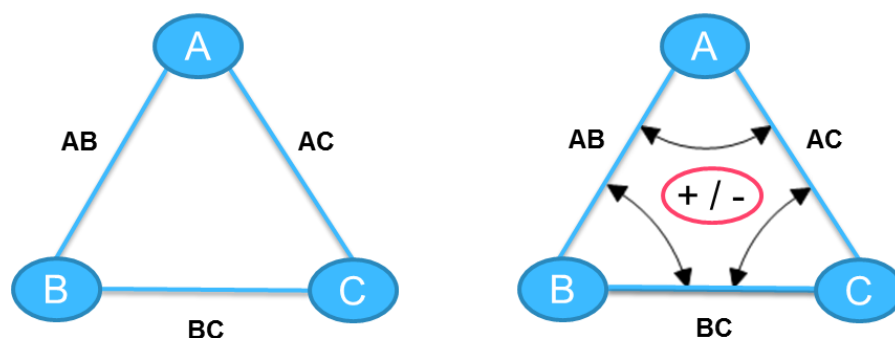


Figure 14. Interconnectedness of relationships in triad.

The interconnectedness effect can be positive (+), negative (-) or neutral (no impact).

Interconnectedness does not exist when two relationships are totally independent from each other. (Ritter 2000, pp. 318 - 321)

Relationships in networks do not exist independent from each other – they are interconnected because a relationship does affect beyond itself and the two actors involved in the dyad. Interconnectedness of relationship may also have either intentional or unintentional effect on and from other relationships. This has been called secondary, indirect or network function of relationships (Håkansson & Snehota 1995) that is interconnectedness. (Easton 1992) This interconnectedness is generic and is scaling up to the larger aggregates of network, even though the effectiveness usually diminishes along the extending scope.

Ritter (2000) has identified ten different cases of interconnectedness in triad. The cases are, as he named them by effect, as follows:

1. Neutrality effect - no interconnectedness between two relationships, which are totally independent from each other.
2. Assistance effect - a one-sided positive effect between two relationships
3. Hindrance effect - a one-sided negative effect between two relationships
4. Synergy effect - a two-way positive effect between two relationships
5. Lack effect - a positive and a negative impact coexist between two relationships
6. Competition effect - a two-way negative effect between two relationships
7. Unitary neutrality effect - three relationships just coexist with no impact on each other
8. Initiation effect - a focal company urges on relationship between subcontractors
9. By-pass effect - a focal company deals directly with a customer and is passing by a retailer
10. Hierarchy effect - a focal company forbids a direct contact between two other

The following example of interconnectedness in Figure 15 includes some of these cases.

An example state				Target			
Inter-connect- edness →	AB	AC	BC	Inter-connect- edness →	AB	AC	BC
AB		-	-	AB		+	+
AC	-		+	AC	+		+
BC	+	+		BC	+	+	

Figure 15. Improving an example triad state by positive interconnectedness.

There is competition effect between AB-AC relationships, lack effect between AB-BC relationships and synergy effect between AC-BC relationships in the example state case in Figure 15. By developing business practices in AB-AC and AB-BC relationships the target state of maximizing the overall synergy in triad can be achieved. Here relational properties can have a significant role in improving the relationships and change the negative interconnectedness of relationships to positive.

2.2.4. Triad governance

Network governance is a set of mechanisms used for monitoring and controlling the behavior of one or a group of organizations with a view to protect the interest of shareholders and community members associated with the system (Provan & Kenis 2007). Governance in its different forms is deployed to manage different tasks and network level objectives (Kilduff & Tsai 2003).

According to Provan and Kenis (2007) there are three basic forms of governance: shared, lead, and network administered. In shared governance member companies together administer the network. Lead governance means that a lead organization manages the network through formal contracts. In network administered governance (NAO, for network administered organization) a separate administrative entity governs the member companies in the network.

Kohtamäki (2005) divides governance of strategic networks into three different mechanisms: price, authority and social. In price governance mechanism the main idea is to support entrepreneurial based price competition for finding new opportunities and continuous improvement. The price governance is transaction cost economics based optimization case by case without long-term commitments to the relationships. This requires that there are several competing suppliers available on the market for the buyer. In authority governance mechanism, the key idea is that an actor in the network uses power over others. This requires that there is a dominant actor (lead company) which has bargaining power and power in general enough to utilize its authority. The lead company orchestrates in hierarchical network and the relationships are governed by

formal contracts. In social governance mechanism, the trust and sense of community are the bonding agents which help to reduce exchange costs and increase the collaborative learning and innovation. It is possible to get considerable cost savings and competitive advantage by utilizing trust as a substitute for formal control mechanisms in supply network (Laaksonen et al. 2008, p. 911).

Interorganizational exchange governance often rests on either relational or transactional type of approach. Fast changing business contexts and contextual contingencies are not ideal conditions for practicing purely relational or transactional governance approach. Understanding the dynamic of key contextual factors and how they effect on organization's resource capabilities and interorganizational power structure is crucial for identifying the best governance structure over time. (Mahapatra et al. 2010).

Cooperative norms, defined as shared beliefs and expectations of cooperation between two parties, often establish the basis of relational ties between actors, and thus are part of relational capital (Cai et al. 2011, p. 2). Relational control in the form of norms or personal relations is often an effective practice of governance (Anderson & Narus, 1984 & 1990; Dwyer et al., 1987; Morgan & Hunt, 1994). Relational governance can improve coordination and performance outcomes (Stephen & Coote 2007, p. 291). Triad partners have an option to utilize relationship-based governance as they have already adopted common norms and solid personal relations in process of time.

A broker may choose to join the disconnected actors and enable direct link between them by relinquishing its power and control in exchange for synergy and self-coordination in the triad. As the result of enacting this so called *tertius iungens* relational strategy the connectivity and level of cooperation increase within the triad (Obstfeld 2005). On the other hand the Klein's (1989) research results of 338 export company study showed that will to control supply channels increased when relation specific investment, environmental uncertainty and transaction frequency increased.

Governing triad gets easier when triad is in a balance state and the actors have a good relationship with each other. Next, the relationship is examined in triad context.

2.3. Interorganizational relationship

The most important function of the business relationship is to interlink the activities in an especial manner in order to help the actors transform resources in creation of optimal value (Håkansson & Johanson 1992). "Organizations are fundamentally relational entities" (O'Reilly 1991; Contractor et al. 2014). Relationship describes the pattern of interactions and mutual conditioning of behaviors between organizations over time. Time is the defining dimension of a relationship. Current behavior in a relationship reflects the past experiences and future expectations. (Ford et al. 2003, p. 38)

Interactions within relationships form the basis for companies to buy and sell products and services, to learn, to invest and take advantage of and acquire technology (Ford et al. 2003, p. 17). Customers and suppliers become better partners, co-producers and even co-developers if they interact more frequently. Quality, productivity and profitability are improved as a consequence of a good relationship. (Gummesson 2008, p. 279) The quality of relationships impacts a company's business to a great extent. Creating and maintaining good quality relationships is really important especially in network business which has become very common in certain business domains in order to stay in competitive business.

The essence of supplier's relationship is the creation of *commitment* and *trust* between itself and customer with intent of establishing, developing and maintaining successful relational exchange. Mutual commitment is a desire to maintain a relationship which is often indicated by an ongoing investment into activities that are expected to maintain the relationship. Trust, also equated to reliability, in general is taken to mean acceptance of vulnerability to another's possible, but not expected, ill will or lack of good will. (Morgan & Hunt 1994, p. 22)

Commitment and trust are key components of a relationship because they encourage partners:

1. to make investments into the relationship
2. to resist taking advantage of alternatives which provide short-term benefits
3. not to behave opportunistically with regard to the relationship

(Morgan & Hunt 1994, p. 22)

Future of a relationship is not certain, relationship is indeterministic. It is changing all the time and it is determined by its history, current and the expectations of future events. Håkansson and Snehota (1995) have brought up a few more problematic issues like loss of control, resource demanding, preclusion from other opportunities and unexpected demands that may come up in a relationship. (Gemünden et al. 1997, p. 59)

2.3.1. Buyer-supplier relationship

In the literature, the dyadic buyer-supplier relationship has been characterized in terms of cooperative versus competitive relationships (Choi et al. 2002). The cooperative relationship emphasizes the explicitness and collaboration between a buyer and a supplier while the competitive relationship focuses more on the practice of information protection and arms-length relationship. Cooperative relationship leads the buyer and suppliers to consider each other as strategic partners, relationship specific investments, and work towards the common goals (Hahn et al. 1990). Wu and Choi (2005) separated

collaborative, professional, alliance, transactional, arms-length, adversarial and working relationship to capture the different characteristics of buyer-supplier relationships. While alliance and collaborative relationships imply close cooperation, shared vision and objectives between a buyer and a supplier, the arms-length and adversarial relationships are just the opposite. In the latter case the buyer's major concern is price reduction which by default means that a supplier is selected based on the lowest price. A transactional or professional working relationship appears to be in the middle of collaboration-adversarial relationship continuum and supplier is replaced if the performance expectations are not met in these relationships.

Buyer's aim is to reduce supply risk. Buyer's intention is to have more than only one source and that the suppliers are under the constant pressure of competition from other suppliers (Wu & Choi 2005). As each supplier is linked to many other business actors through a network of business relationships, it is obvious that inter-organizational relationships between organizations pose potential sources of risks for customer's project business for example (Artto et al. 2008, p. 89).

Buyer may want to be aware of network relationships beyond its direct supplier relationships. To do so it needs to identify the key companies the supplier is doing business with and the intensity of those relationships. The supply network tier analysis utilizing e.g. strengths, weaknesses, opportunities and threats (SWOT) analysis is an option for doing this. Knowledge of supplier's network and relationships could provide new opportunities to do business and strategically valuable information for forecasting the future performance of the supplier. (Choi & Kim 2008, pp. 9 - 10)

Supplier-supplier relationship studies pointed out that a dyadic relational link between a buyer and a supplier operates differently when there are two or more competing suppliers involved in the relationship. (Wu & Choi 2005, pp. 28-29) Suppliers' relationships have an influence on buyer's relationships and vice versa.

2.3.2. Supplier-supplier relationship

Wu and Choi (2005) defined five supplier-supplier relationship archetypes. The *conflicting* archetype describes a supplier-supplier relationship where one supplier is willing to work with the other supplier, while the other supplier is not. The *contracting* archetype is characterized as a supplier-supplier relationship where two suppliers to the same buyer are in a relationship where one supplier is supplying to the other. The *dog-fighting* archetype describes suppliers which participate in a free market style, zero-sum game competition where minimal direct interaction takes place between them. The *networking* archetype collaborates willingly with the other suppliers to meet the buyer's requirements. In the *transacting* archetype two suppliers maintain a pure professional working relationship to optimize the gains for each.

The supplier-supplier relationship is characterized by competition and cooperation which may take place simultaneously. Depending on the nature of the relationship the attitude and information sharing practices vary quite much. When the only target is to fulfill the minimum of contractual obligations, the level of cooperation easily remains low and the efforts made for developing the relationships and business practices are rare. (Wu & Choi 2005, p. 42 - 43)

The competing suppliers are very reluctant to work together as Cross (1995) stated in his study of suppliers of British Petroleum. If suppliers do not supply the similar products or services and not offer similar capabilities, they are not direct competitors. This supplier-supplier relationship has more room for cooperation and flexibility for evolution that buyer may be looking for. Buyer can also affect and facilitate the cooperation between two suppliers. By doing so the suppliers seem to oblige and comply better (Wu et al. 2010, p. 120).

When suppliers interact with each other in technical tasks, they exchange information explicitly. However, closely coupled suppliers were seen to exchange tacit information as well to boost their common operations. So, how much supplier can learn from and utilize the other supplier's business processes and practices depends on the nature of the relationship, which on the other hand has great impact on mutual performance. For a cooperative supplier-supplier relationship, each has to be willing to see equity in the relationship. (Wu & Choi 2005, p. 42 - 43)

2.3.3. Partnership unites triad actors

According to Ploetner and Ehret (2006) a vertical partnership is a specific type of relationship based on mutual dependency and trust between actors, where both are committed to collaboration beyond a sequence of buying-selling transactions. Partnership relation aims for common benefits without abusing the other partner. Partnerships are quite common among the car manufacturers for example. In addition to partners standard supply collaboration they arrange joint training courses for employees and even engage in common advertising campaigns. Anderson and Narus (1990) perceived this as a special type of working partnership in which collaboration is based on the mutual recognition and understanding that *the success of each firm depends on the other firm in part*. Choosing the right suppliers is essential for developing the partnership relations.

Standard criteria of quality, price and delivery are necessary, but not sufficient conditions for assessing and selecting suppliers as long-term partners. Factors that determine long-term future performance and the potential for improvement and innovation need to be identified (Hamel & Prahalad 1994). Intangible relational issues

such as trust, commitment and openness are also involved in successful partnership. (Saunders 1997, p. 265)

In order to establish a partnership all parties involved must demonstrate both the abilities and the motivation to cooperate in the partner relationship. Generally, companies will not engage in partnering relationship with companies that do not show the ability and motivation for fulfilling the objectives of the relationship. (Gemünden et al. 1997, pp. 99 - 107)

The evolution of partnerships is a time consuming process (Dwyer et al. 1987). Partnership can evolve through positive common experiences and outcomes of the cooperation when quality, intensity and content of collaboration develop favorably over time.

On the other hand, the companies are reluctant to partner with companies, that:

- a) are small relative to the company's total demand
- b) are unimportant as a supplier or a customer
- c) are unreliable in fulfilling agreements
- d) lack innovative outlook
- e) have a generally low reputation

Companies with low relational orientation are less likely to engage in partnering relationship. Lower relational orientation may stem from:

- f) inhibitive company policies
- g) transaction-based reward systems
- h) corporate belief systems
- i) rigid organizational structure
- j) restricted flows of communication

(Gemünden et al. 1997, pp. 99 - 107)

Partnerships are distinct from ordinary relationships. Partnership requires inter alia high level of trust, common norms, common vision for future benefits and restraint of partners from abusing powers. (Ploetner & Ehret 2006)

Sustainable partnerships reside in a broad basis of personal interactions throughout all hierarchical levels and cooperating functions of the partner companies. This leads to an institutionalized form of collaboration, which can survive in spite of individual members leave organizations. Fliess and Becker (2006) suggested that informal modes of coordination gain importance compared to contractual coordination when collaboration becomes more intensive. Intense collaboration and trust are built on personal interaction. Therefore partnerships rely on a network of personal relationships

and social capital as value gained from the social network relationships. (Ploetner & Ehret 2006, p. 7)

2.3.4. Relationship quality

Relationship quality can be seen on two levels, relationship quality at interpersonal level among employees and relationship quality at inter-/organizational level e.g. between buyer and supplier organizations. The concept of relationship quality is a higher order construct consisting of several distinct but related components or dimensions: perceived service quality, trust, commitment and satisfaction (Rauyruen & Miller 2007, p. 22). Relationship quality includes measures of satisfaction, commitment and closeness (Crocker & Canevello 2010 p. 22). Researchers have found that relationship quality comprises trust, commitment and satisfaction (Moorman et al. 1992, Rauyruen & Miller 2007).

The quality of business relationship can be evaluated with relational measures. Buyer satisfaction is an important aspect of relationship quality and a significant predictor of the anticipated continuation of business relationships (Crosby et al. 1990). Relational properties are examined in the dedicated Chapter 3.

Supply network business is based on the reliable supplier relationships and strategic supply network management. Choosing the right partners, actors doing business with, is very essential in order to get competitive advantage, add value of each in supply network and provided quality products and services for customers benefit. Effective utilization of resources and capabilities requires cooperation with capable suppliers in supply network. Supply network makes it possible to do things in parallel and shorten lead times, and in addition it gives flexibility to better adapt to the changes in the whole business environment. Supply network can be utilized and managed better with composed triads, larger cohesive units, which each has shared objectives and benefits, trust based governance in first place and sense of community. Being in the same boat and having the same chart help along the voyage to get everyone to the same port of destination. Relational compatibility between the actors is required for a long-term well-functioning relationship. Relational properties have influence on relationship quality. Trust is the first requirement in forming and developing triadic relationship among actors. Actors in triad are seeking the relationship quality and benefits. Relational properties have essential role in triad forming and achieving the state of balance in triad. The next Chapter 3 introduces the relational properties on theory perspective.

3. RELATIONAL PROPERTIES

Relational properties concern matters that are reflecting and affecting relationship(s) between two or more interrelated actors. A relationship can be characterized in part by relational properties. Relational properties are many and they differ from each other by nature and scale. Essential relational properties and related sub-features are listed in Table 2.

Table 2. Relational properties examined in this study.

Relational properties	including	abbr.	Author
Trust	Reputation, former experiences, mutuality, solidarity, role integrity, monitoring behavior, uncertainty, risk, organizational culture and norms	T	Ivens 2006
Commitment	Dependency, importance, motivation, attitude, loyalty	Com	Ivens 2006
Collaboration	Longevity, regularity, intensity, information exchange, flexibility, satisfaction, relational planning, routinization, content, formality, adaptability, transparency, conflict resolution	Col	Gummesson 2008
Relational Behavior	Initiating Behavior Signaling Behavior Disclosing Behavior Interaction Frequency Closeness & face-to-face proportion Distribution <ul style="list-style-type: none"> • Lateral Involvement • Vertical Involvement Attraction Personal and social properties	R	Leuthesser 1997 Leuthesser & Kohli 1995 Gummesson 2008
Power	Restrain in use of power, bargaining power, adaptation, acquiescence, constraints, empowerment	P	Gummesson 2008

Relational properties are embedded in social capital, which makes it possible to achieve something that cannot be achieved without it in social exchange process in business

context as well. Therefore, the relational properties of a relationship must be at good enough level to form and develop a well-functioning triadic relationship in the purpose of becoming the integrated part of the key partner supply network. In triad context control and governance are easier to implement and manage when relational properties are in a good state. This in turn allows reducing the amount of effort and resources in the controlling and monitoring tasks and activities within a triad.

The need for relational practice development can be evaluated by measuring and analyzing these relational properties. In the following sections relational properties in Table 2 and the interrelated social capital and social exchange are presented based on theory from the literature review.

3.1. Trust in interfirm relationship

Trust exists when one party has confidence in an exchange partner's reliability and integrity (Morgan & Hunt 1994, p. 23). Trust refers to the expectation that both actors will behave in a mutually acceptable manner and neither party will exploit the other's vulnerabilities (Sako & Helper 1998, p. 388). Trust lubricates collaboration and collaboration itself breeds trust (Nahapiet & Sumantra 1998, p. 225).

Trust can be investigated at two different levels depending on the object of trust. At interpersonal level, the object of trust is the member of the partner organization while the partner organization itself is the object at interfirm level investigation. (Laaksonen et al. 2008, p. 911) Some other underlying dimensions of trust that scholars have brought up are for example the differentiation between personal characteristics and organizational capabilities, and occurring in cognitive and affect-based forms of trust. The former originates from reliable role performance, cultural-ethnic similarity, and professional credentials, while the latter is a function of organizational citizenship behavior and interaction frequency. Both of these forms of trust were found to enhance coordination between counterparties by reducing administrative costs. (Handfield & Bechtel 2002, p. 372)

Moorman et al. (1993, p. 93) research results indicate that trust would be more a function of interpersonal factors than of individual factors, i.e. trust can be seen as a relational property. The literature indicates that there is a strong relational element in trust (Mayer et al. 1995; Young & Wilkinson 1989; Havila et al. 2004).

According to Young and Wilkinson (1989, p. 120) trust in business relationships is based on the overall relationship rather than on the particular episodes of behavior or particular people involved in the relationship.

Laaksonen et al. (2008) distinguish three types of trust: contractual, competence, and goodwill. These are described in Table 3. Usually each of these forms of trust is present

in an interfirm relationship and is developing over time. The more the mutual trust develops the less probable is actor's opportunistic behavior and goal conflict. At the same time the predictability of actor's behavior increases leading to the lower transaction costs. Interorganizational trust enables smooth and ease negotiation processes and thereby reduce the transaction costs of interfirm exchange (Zaheer et al. 1998).

Table 3. Conditions conducive to the emergence of contractual, competence, and goodwill trust in customer-supplier relationships (Laaksonen et al. 2008)

<i>Type of trust</i>	<i>Conditions conducive to the emergence of trust</i>	<i>Author</i>
Contractual trust	<i>Reliance on oral agreements</i>	<i>Sako (1992)</i>
	<i>Contracting costs are avoided</i>	<i>Dyer and Singh (1998)</i>
	<i>Legal sanctions like non-disclosure agreements are not used</i>	<i>Gulati and Singh (1998)</i>
		<i>Pisano (1990)</i>
Competence trust	<i>Good and competent reputation</i>	<i>Barney and Hansen (1994)</i>
	<i>Consistent deliveries of high quality products in a timely accurate manner</i>	<i>Gulati, Nohria, and Zaheer (2000)</i>
	<i>Transaction specific investments and commitment</i>	<i>Cooper and Slagmulder (2004)</i>
		<i>Sako (1992)</i>
	<i>Repeated interaction</i>	<i>Suh and Kwon (2006)</i>
	<i>Minor use of formal output controls</i>	<i>Gulati (1995)</i>
Goodwill trust		<i>Tsai and Ghoshal (1998)</i>
		<i>Das and Teng (2001)</i>
	<i>Cooperative supplier management practices: avoiding competitive bidding, supplier selection based on competence rather than price</i>	<i>Sako and Helper (1998)</i>
	<i>Decentralization of decision making</i>	<i>Sako (1992)</i>
	<i>The fairness of the relationship: risk sharing and profit distribution agreements</i>	<i>Ring and Van de Ven (1992)</i>
	<i>Sharing of valuable information</i>	<i>Das and Teng (1998a)</i>
	<i>Long-term projected length of trading</i>	<i>Jarillo (1988)</i>
		<i>Dyer and Chu (2003)</i>

Utilizing trust as a substitute for formal control mechanisms significant cost savings and possible competitive advantage can be achieved in a good interfirm relationship. (Laaksonen et al. 2008, p. 911)

Counterpart's relationship investments affect trust. Trust increases the propensity to invest in the relationship (Havila et al. 2004). Relationship investment increases trust and trust in turn increases probability to relationship investments. Investments in supplier relationships are done to minimize risk, involving activities traditionally considered the exclusive domain of the other party. Investments in relationship usually lead to significant increase in the quality and duration of relationships, which in turn increases the likelihood to make greater mutual investments in future transactions. So, in this regard, trust inevitably requires some sense of mutuality and reciprocal loyalty. (Handfield & Bechtel 2002)

Trust is indispensable in social relationships as it allows social interactions to proceed in a simple and confidential manner. Although trust exists between the actors, there is

always a potential risk that an actor may behave in a way that is not desirable for the relationship. The critical aspects of trust in a relationship concern the actor's belief that the counterpart's actions will result in positive outcomes for the actor. In empirical studies a positive direct or indirect link from communication to trust has been found. (Havila et al. 2004, Anderson & Narus 1990, Morgan & Hunt 1994) Trust among actors in interorganizational relationships improves communication and dialogue and can be foundation for creating common strategic visions. (Heide & John 1990; Handfield & Bechtel 2002)

Trust is the foundation for a relationship to start cooperation and build commitment to long-term partnership. Like in high-rise building the solid foundation is must (as is trust in business) in order to reach the top floor and withstand the environmental impacts.

3.2. Commitment in interfirm relationship

Commitment is broadly defined as the strength of an attachment to another social unit such as a group, organization, or community (Kanter 1968). Commitment to the relationship is defined as an enduring desire to maintain a valued relationship indefinitely (Moorman et al. 1992, p. 316). Commitment can be seen as a behavioral concept that captures a dynamic element in the relationship. Strong commitment paves the way to the further investments and continuation of relationship (Havila et al. 2004). Morgan and Hunt (1994, p. 23) define commitment as an exchange partner believing that an ongoing relationship with another is so important that it warrants maximum effort at maintaining it i.e. the committed party believes the relationship is worth working on and ensuring it in future. In this definition, three core aspects are expression of value judgment, aim to preserve the relationship by stabilizing it and that commitment stems from an effective silent agreement and a sense of honor which goes beyond the current expected utility of exchange (Ivens 2004, p. 302). Krause et al. (2007) found that commitment between the two firms is an important complementary condition to establish performance goals and to provide added value to buyer via social capital accumulation with suppliers.

Many studies have shown that communication is one antecedent to commitment. Anderson & Weitz (1992) showed that past communication between the actors affected to relationship commitment. According to Halinen (1997) strong personal relationships and intensive interorganizational contacts are important factor prior to commitment. Long-term orientation and solidarity affect positively actors' mutual commitment, which in turn furthers collaboration substantially.

3.3. Interfirm collaboration

Collaboration literally means working together to a common aim that individuals or organizations are set. Collaboration is a way forward for organizations in situations in which working alone would mean failure to achieve the desired ends. (Huxham 1997)

Most definitions of collaboration are based on the following assumptions (Bititci et al. 2004).

Collaboration is:

- taken to imply a very positive form of working in association with others for some form of mutual benefit (Huxham 1997).
- a distinct mode of organizing implies a positive, purposeful relationship between organizations that retain autonomy, integrity and distinct identity, and thus, the potential to withdraw from the relationship (Huxham 1997).
- a number of companies linked to create and support a service or product for its service life including final disposal (Jordan and Michel 2000).
- a focus on joint planning, coordination and process integration between supplier, customers and others partners in a supply network. Also involves strategic joint decision making about partnership and network design (McLaren et al. 2000).
- a process in which organizations exchange information, alter activities, share resources and enhance each other's capacity for mutual benefit and a common purpose by sharing risks, responsibilities and rewards (Himmelman 1992).

Collaboration reflects collaborative culture, joint planning, resource sharing, joint problem solving and performance measurement (Kumar 2012, p. 909). Collaboration with external partner has become an important part of business practice for companies to enhance their capabilities. The number of interfirm collaborations has increased substantially over the past decades and collaborations have become a central component in many companies' strategy (Lavie 2007; Pulles et al. 2014) Some resources and skills are better to acquire through collaboration with actors specialized to the subject. When organization cannot gain advantage from performing certain activities internally, it can access complementary capabilities from external providers in supply network (McIvor 2009, p. 47).

Supplier's collaborative attitude and the buyer-supplier relational characteristics on buyer-supplier relationships explain an important part of a supplier's higher than the average contribution to buyer innovation (Pulles et al. 2014).

Some motives and benefits that can be achieved by collaboration are presented in the following Table 4.

Table 4. Collaborational motives and benefits. (Bititci et al. 2004)

<i>Scope</i>	<i>Motive or Benefit</i>	<i>Author</i>
Asset management, quality and competence	Increase asset utilization	Lewis (1990)
	Increase quality of product	
	Enhance skill and knowledge	
Performance improvement	Share and reduce the cost of product development	Lewis (1990), Parker (2000), Horvath (2001), McLaren et al. (2000)
	Enhance customer service – reduction in lead times, customer complaints, etc.	Lewis (1990)
	Reduce time in product development	Lewis (1990), Parker (2000), McCarthy and Golicic (2002), McLaren et al. (2000)
	Have technological gain as participating firm	Lewis (1990), Parker (2000)
	Decrease risk of failure of product development	Parker (2000)
Risk management	Reduce inventory – in the face of increasing technological complexity and rapid rate product development and obsolescence	Parke, (2000), Holton (2001)
Market share and access	Increase their market share	Lewis (1990)
	Gain rapid access to markets	McCarthy and Golicic (2002), Parker (2000)
	Achieve economies of scale in production	Lewis (1990)

Collaboration can be continuous or based on a deal for a certain period. There is relation between collaboration and competition. In situation of low degree of competition the collaboration has more space to evolve. High degree of collaboration combined with low degree of competition provides a good base for a long-term harmonious relationship. (Gummesson 2008, p. 30)

3.4. Relational behavior in business context

Leuthesser and Kohli (1995) found at least three important aspects of relational behavior from literature review of group theory, marketing and organization behavior. The first aspect relates to the type of information a supplier obtains from and provides to a buyer. Behaviors that appear to be central in this respect are *initiating*, *signaling*, and *disclosing behaviors*. The second aspect of relational behavior relates to the *frequency of interaction* and the *richness* of the medium of that interaction. The third aspect of relational behavior indicates the extent of *lateral* and *vertical involvement* in interactions between organizations' functions and hierarchical levels. (Leuthesser & Kohli 1995, pp. 221-222)

Supplier's relational behavior and relational properties in general have impact on buyer's satisfaction and continuity of business relationship. In Figure 16, these relations are depicted.

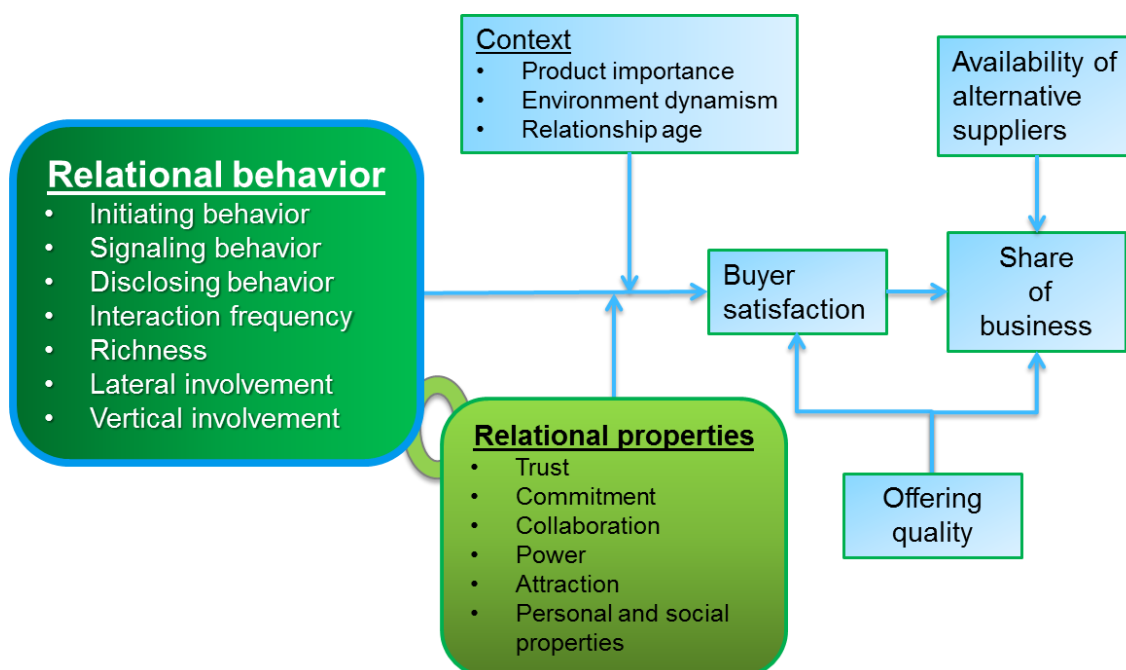


Figure 16. Relational behaviors and their consequences (modified from Leuthesser & Kohli 1995).

Relational properties can be seen as a foundation for a business relationship and relational behavior part as an apparatus to uphold customer's satisfaction at continuous relationship. In relational skills the both relational behavior and properties are taken into account. The better the relational skills an actor has the better the aspects of relationship are taken into account with continuous desire to improve the relationships. The elements of relational behavior are presented next.

Initiating behavior refers to a supplier's proactivity to initiate efforts in order to better understand a buyer's needs and requirements and help in increasing buyer's competitiveness. Initiating behavior is likely to send a positive signal to the buyer about the supplier's genuine will to learn the buyer's business and supplier's motivation to perform in the buyer's interests. (Leuthesser & Kohli 1995, p. 222)

Signaling behavior refers to a supplier's manner to inform a buyer about the intended changes in advance. Signaling behavior helps a buyer to look ahead to modify plans if necessary and avoid unpleasant surprises. Giving advance notice of impending changes is likely to engender greater satisfaction with the supplier. (Leuthesser & Kohli 1995, p. 223)

The extent to which a supplier is perceived to provide sensitive information about itself is referred as *disclosing* behavior. Disclosure of sensitive information places the giver at a potential risk and implies trust towards receiver to not misuse the information. (Leuthesser & Kohli 1995, p. 223)

Interaction frequency indicates activity in information exchange and sharing, which in turn affects directly to the level of uncertainty and ambiguity. Higher interaction frequency reduces the uncertainty and ambiguity. This is also likely to lead to greater buyer's satisfaction when supplier understands and better meets to buyer's needs and thus increases relationship quality as well. (Leuthesser & Kohli 1995, p. 223)

Face-to-face proportion of total interaction between a supplier and a buyer defines the *richness* of relational behavior. In face-to-face interaction additional information about voice inflection, facial expression and other non-verbal clues are available for more accurate mutual interpretation and understanding. (Leuthesser & Kohli 1995, p. 223)

Distribution of interaction can be observed from lateral and vertical involvement perspectives. *Lateral involvement* measures interactions in different functions between buyer and supplier. Counterparty members are directly in touch and therefore get first-hand information without distortion that passing through a detour may cause. Achieved accuracy in understanding the requirements and need for coordination of supplier's activities increase customer's satisfaction. *Vertical involvement* measures the extent in which a buyer's interactions are distributed across different hierarchy levels within a supplier organization. Trust and satisfaction are enhanced in a group when a greater number of individuals are engaged in ongoing interaction. (Leuthesser & Kohli 1995, pp. 223-224)

Personal and social properties like age, gender, profession, education, ethnicity, personality type and personal traits have impact on relationships in social business networks for example in formation of patterns of relationships like cliques, clusters and blocks. Charm, charisma, good impression and chemistry are examples of recognizable properties that have a great effect on personal as well as on business relationships. (Gummesson 2008, p. 35) Personal similarity has more positive effect on relationship when the level of dependence is low, whereas the effect diminishes when the level of dependence increases (Biong & Selnes 1995, p.492).

Harris et al. (2003) define *attraction* as the extent to which relational partners perceive past, current, future or potential partners as professionally appealing in terms of their ability to provide superior economic benefits, access to important resources and social compatibility. Attraction between companies may require a combination of rational financial motives and psychological factors. A parasocial relationship – relationship to brands and objects – do not only exist with people, but also with objects and mental images – symbols – such as brands and corporate identities. (Gummesson 2008, pp. 33-38) Attraction has a motivating role in business relationship development (Harris et al. 2003). In each case a certain amount of attraction is a necessary precondition for the commencement of interaction, while current attraction determines whether parties are motivated to maintain their relationship (Dwyer et al. 1987).

3.5. Power in business network

Dahl's (1957, p. 202) classic definition of power: A has power over B to the extent that A can get B to do something that B would not otherwise do. This definition implicitly assumes that B is unable to escape from the relationship. (Olsen et al. 2014, p. 2580)

Power has long been recognized as an essential property of interaction in business networks (Olsen et al. 2014, p. 2579). Emerson (1962) view power as stemming from the relational arrangements of entities in network-like contexts. Networked power is actors' attempts to utilize their current position in a multi-actor network to allocate and decouple actors, resources and activities according to their own benefit (Olsen et al. 2014, p. 2580). An actor's relations with other actors, over whom it has some power, determine its network position in the network. The direct and indirect relations form part of an actor's power base, through its ability to access and control to some extent the resources of other actors in the network (Mattson & Johanson 1992). Actor's power is therefore inherently relational and derived from an actor's position which Thorelli (1986, p. 40) called also as 'a location of power'. This 'positional' power is also normative meaning that actors can exert influence over others through shared values and expectations, which can be seen as a special type of legitimate base of power. (Welch & Wilkinson 2005, p. 206)

Rarely each party has the same amount of power in a relationship. In an asymmetrical relationship, the weaker party may feel used, but keeps the relationship functioning because there is not better alternative. If the relationship is unfair, the weaker party is likely to seek opportunity to exit. (Gummesson 2008, pp. 30-31)

The level of actor's discretionary control over the critical resource explains the relative distribution of power. Asymmetric dependence leads to power imbalance and advantage to a specific actor which may limit the autonomy and constrain the behavior of the other actor. (Mahapatra et al. 2010, p. 539) The more power an organization has, the more it can influence on the nature of the interorganizational exchange, the form of the interaction and the ratio of exchange (Cook 1977, p. 66). Power is better to exercise in ways that empower rather than disempower others in a triad which is aiming balance and cooperative state, and the common benefits.

3.6. Social capital as relational factors' aggregate

Social Capital Theory (SCT) gained popularity in the 1990s by directing attention to company's social network as a source of competitive advantage (Baker 1990, Burt 1997; Roden & Lawson 2014, p. 90). According to Dyer & Singh (1998), firms can leverage advantage in their social relationships by moving away from arm's-length

exchanges and focusing on specific investments, knowledge exchange, complementary competencies, and more effective governance mechanisms.

Social capital exists in the social networks of actors (Burt 1997). Related construct which is applied to an inter-organizational context is relational capital. Relational capital is defined as a form of social capital embedded in a single business relationship. It consists of dimensions such as trust, open interaction, and a feeling of shared destiny (Chang & Gotcher 2007). Relational capital decreases transaction costs (Sako 1992), and increases relationship commitment (Morgan & Hunt 1994).

Social capital is a valuable asset that originates from access to resources made available through social relationships (Granovetter 1992). Nahapiet and Ghoshal (1998) proposed three dimensions of social capital: structural, cognitive, and relational. According to them, the structural dimension is related to social capital resulting from the structural configuration, diversity, centrality and boundary-spanning roles of network participants. The cognitive dimension of social capital refers to the resources that provide shared representations, interpretations, and systems of meaning to the parties e.g. the shared goals, norms, vision and values between actors (Tsai & Ghoshal 1998). The relational dimension refers to actor's relationships that develop through a history of interactions to the extent to which trust, obligation and reciprocity exist between actors (Krause et al. 2007). As can be noticed the relational dimension of social capital and relational properties are very interrelated and deal with the same matters which affect relationship quality.

Actors have financial, human and social capital which is generated from their position in the social structure. These different capitals are the resources actors have at their disposal to maximize their utility at network. Financial capital is owned by an actor in the form of money or other property. Human capital is a combination of natural qualities, like charm, health or intelligence and skills that have been acquired in the formal education and practical training. In contrast to the other forms of capital, *social capital is the content of relationships among actors*. Actors cannot possess the property rights to social capital alone like in the case of financial and human capital. Related actors possess social capital mutually until actors finish with each other and the related social capital vanishes (Burt 1992, pp. 8-9). Supply network consists of multiple relationships and thus also of social capital. According to Burt, networks can be viewed on different levels: 1) networks of individuals, 2) networks of subgroups, or 3) different subgroups as a structured system. These levels of aggregation can be characterized by a relational dimension and a positional dimension of network. (Häuberer 2011, pp. 88-89)

According to Coleman (1990, p. 302) a special feature of social capital is its form that inheres in the structure of relations between actors and among actors unlike the other forms of capital. This also means that social capital has the characteristic of being

inalienable (Loury 1987) and a public good since it is not a private good for any embedded actors (Coleman 1990).

Unlike the way physical capital is created by processing materials into half-finished products and tools for production, and the way human capital is created by learning new skills and enhancing capabilities, social capital arises through changes in relations among people who enable action. Hence *social capital exists in relations* and is less tangible than physical or human capital. Social capital is shared by nature. Coleman (1990) states that when investing actors gain benefits from social capital, also other actors involved in the social structure benefit. (Häuberer 2011, p. 40)

Closure and stability are factors which influence social capital as a whole. Social structures comprise different levels of closure. A social structure is closed if relations exist between all associated actors. Closure affects access to information (Coleman 1990, p. 310). Those actors with dense networks have higher amount of social capital at their disposal than actors with sparse networks. Social capital depends on the stability of the social structure and the relations. Disruption in social organization or social relations destroys social capital. Coleman (1990) points out the benefit that network closure facilitates sanctions and thus makes it less risky for actors in the network to trust one another. Like physical or human capital also social capital loses value over time. Social relations fragment, expectations and obligations loose importance, connections erode and norms expire. Like physical and human capital social capital requires maintenance to remain productive. (Häuberer 2011, pp. 41-42; Lesser 2000, p. 8)

The central proposition of social capital theory is that networks of relationships constitute a valuable resource for the conduct of social affairs, providing their members collectively owned capital – a credential – which entitles them to credit, in the various senses of the word (Bourdieu 1986, p. 249). Much of social capital is embedded in networks of mutual acquaintance and recognition. (Nahapiet & Sumantra 1998, p. 243)

Relational embeddedness describes the kind of personal relationships people have developed with each other through a history of interactions (Granovetter 1992). It focuses on the particular relations people have, such as respect and friendship, that influence their behavior. People fulfill such social motives as sociability, approval, and prestige through these ongoing personal relationships. (Nahapiet & Sumantra 1998, p. 224) Social capital forms in social exchange.

3.7. Social exchange

The core explanatory mechanism of social exchange theory (SET) is the relational interdependence, or relational contract, that develops over time through the interactions of the exchange partners (cf. Dwyer et al. 1987). In relationship development the social

contact pattern between the exchanging actors is a critical element (Cunningham and Turnbull, 1982). As SET focuses on the relationship between the exchange parties as the governance mechanism of exchange, it is especially useful for explaining B2B relational exchange (cf. Anderson & Narus 1990; Dwyer et al. 1987). Increasing trust and commitment are consequences of social exchange process in the relationship, in which the weak initial unilateral dependence of one of the actors is transformed into a growing mutual interdependence (cf. Kelley & Thibaut, 1978). Social exchange is based on unspecific duties instead of the formal contracts and related exact quantities in transaction based economic exchange (Mäenpää 2013, pp. 56-57). Relationships evolve through a social exchange process in which the actors develop their relationship in interactive sequences (Anderson & Narus 1990; Dwyer et al. 1987; Morgan & Hunt 1994). One actor takes the initiative to do business with the counterpart actor by investing resources in bilateral business. To the extent that the counterpart responds, the interaction evolves sequentially and the actors' mutual commitment increases in these development increments, which in part allows cooperation in the future.

The idea behind and motivation for social exchange is a kind of reciprocity rule i.e. when one does a favor to another, the one expects a reward in return. Cropanzano and Mitchell (2005) stated it smartly: "Social exchange comprises actions contingent on the rewarding reactions of others, which over time provide for mutually and rewarding transactions and relationships".

Summarizing this chapter shortly based on the relation of content to triad forming and developing follows next. Social capital increases in social exchange and social exchange increases in the transitive and unitary triads. Relational properties are inevitably affecting in forming and developing triad and how well it is working. Trust is required in intrafirm commitment to collaboration. Appropriate and decent relational behavior is expected for keeping triad operations running well. The rules of use of power should be agreed together. Awareness of common rules and the fair play let actors focus on the real business objectives and good cooperation to achieve these together without unnecessary tensions. Social capital including the relational properties requires maintenance to remain productive. Actors must pay attention to customer relation management (CRM) and make sure that the level of each relational property is satisfactory among triad actors and relational factors are not preventing good co-operation and results.

4. RESEARCH METHODOLOGY AND MATERIAL

In this chapter, the empirical research context and the methods of data collection and analysis are described. The unit of analysis is triad and focus of research is on relational properties. This thesis approaches relational issues in interfirm relationship context by qualitative case study methods such as the survey and interviews. The distinctive need for case studies arises out of the desire to understand complex social phenomena. The conceptual-analytical approach is applied to the theory examinations of the central concepts of the study.

4.1. Research methods

The case study research method was selected due to the suitability for empirical research and empirical data collection in the case environment. The case study method allows investigators to retain holistic and meaningful characteristics of real-life events such as small group behavior, organizational and managerial processes and relations (Yin 2009, p. 4).

Based on the literature review on the subject the business/supply network elements and related framework for the case study was established and relational properties selected for the survey. Relational measures were selected for getting findings in trust, collaboration, commitment, behavior and power areas. These key relational properties have immense effect on the relationships in triad and therefore measuring them is vital to find the current shortcomings and related development ideas for triadic relationships. Brief theory part is presented for each essential element involved in research framework. Based on used theory the sufficient operational set of measures were tried to achieve with the set of created questions for the survey. Empirical data collection of the selected relational properties took place in the interviews during the survey. The data analysis and derived results reflect presented theory.

4.2. Case study research process

Case study research is linear but iterative process which consists of several phases (see Figure 17).(Yin 2009)

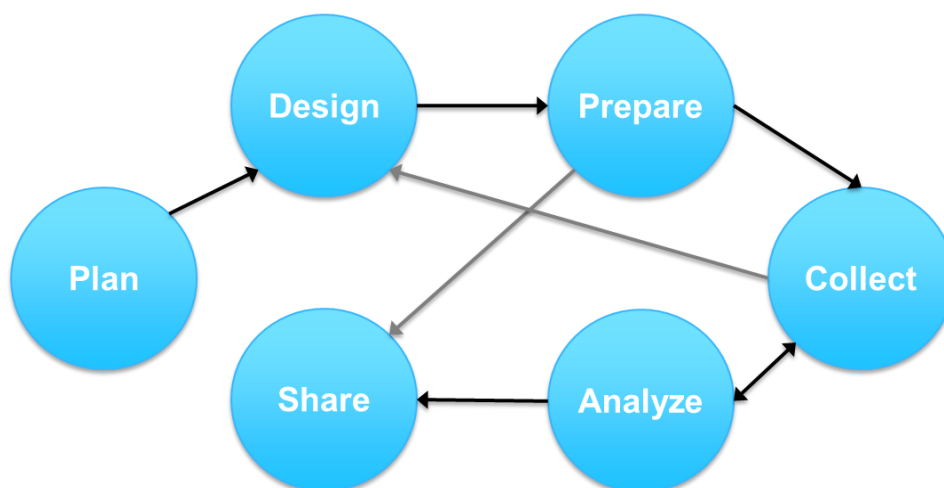


Figure 17. Case study process. (Yin 2009)

In *planning phase* research questions are identified and suitability of case study research method is ascertained by understanding its strengths and limitations among other things. Research process started with literature review of topics under investigation. Relational theme was selected and related literature review done in planning phase of the case study. Preliminary knowledge of triads, business relationships and relational properties were gained in early literature review phase. Literature review was a continuous process during the thesis work and led to select the relational properties studied in considered case triads and theory framework used in the thesis.

In *designing phase* the unit of analysis and case(s) to be studied are defined. Theory, propositions, if any and the issues underlying the anticipated study are developed and the case study design is identified. Procedures to maintain case study quality, e.g. the criteria for interpreting the findings, need to be defined. Triad was defined as the unit of analysis in this case study. The appropriate questionnaire and versatile questions of relational themes were created for the empirical data collection purpose.

In *preparing phase* case study protocol is developed, case study investigator's skills are honed and training with required material done for ensuring adequate results in data collection phase. The questionnaire was fine-tuned in order to get written notes entering quick and easy. Voice-recording functionality was ensured. Schedule of interviews was set and interview places were agreed.

In *data collecting phase* the case study protocol is followed and data collected about actual human events and behavior using multiple sources and appropriate methods to maintain the chain of evidence. The data collection took place in interviews. The same questions were asked from both parties in dyadic relationship, currently and in triad context, to increase the validity and reliability of answers by multiple sources.

In *analyzing phase* an overall analytic strategy is needed. It relies on the theoretical framework described and uses quantitative or qualitative data or both preferably with analytic techniques. Data analysis consists of examining, categorizing, tabulating, testing, or by other means recombining evidence in order to draw conclusions from empirical data. Data is displayed apart from interpretations and rival explanations are explored. Quantified data was analyzed with Excel application. Quantitative data were examined and categorized. Conclusions were drawn and research questions were answered.

In *sharing phase* audience is defined to whom textual and visual materials are composed with enough evidence for reader to make his or her own conclusions. Preliminary and summary results were delivered to and presented in meeting with representatives of the focal company. The final report is this thesis.

4.3. Case selection

The case was selected based on the objectives of both Rebus project and the focal company. The focal company wanted to develop business practices in its supply network to be able to achieve better coordination of support services in changing situations and thus avoid the unnecessary waiting times and conflict situations in production. A network business model could be a solution for this and in addition it was on the focus of Rebus research project at the same time. Therefore, in this thesis the triadic network business model was selected and examined as a possible solution to achieve the common objectives in the relational network business research and development.

The focal company selected six key suppliers to participate in this case study. The case study was done for these suppliers and related functions in the focal company. The focal company proposed the following case study context (F, S1, S2, S3, S4, S5 and SS) included in Figure 18 as a part of an imaginary supply network. The focal company's customer O and supplier M are not part of this case study as is the case with the imaginary suppliers X and Y of supplier S1.

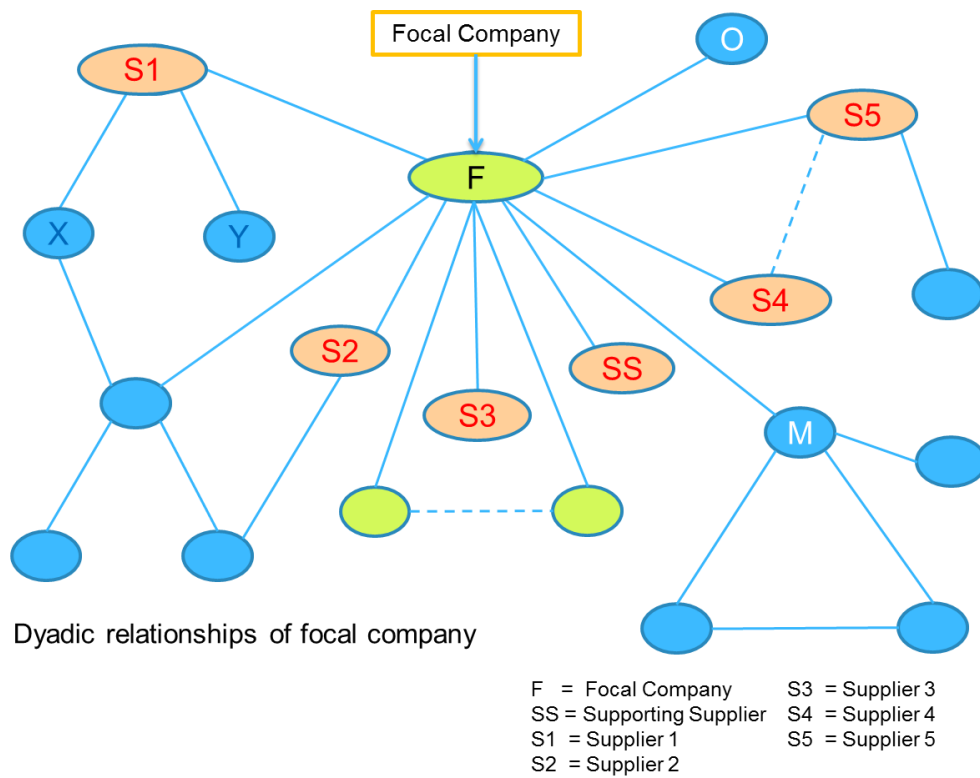


Figure 18. Dyads in supply network.

Figure 18 depicts the dyadic relationship situation at the beginning of the research. As the purpose of the research was to survey possibilities to form triads and utilize triads instead of dyads in case study part of supply network, triads are presented next. These predefined triads are depicted in Figure 19.

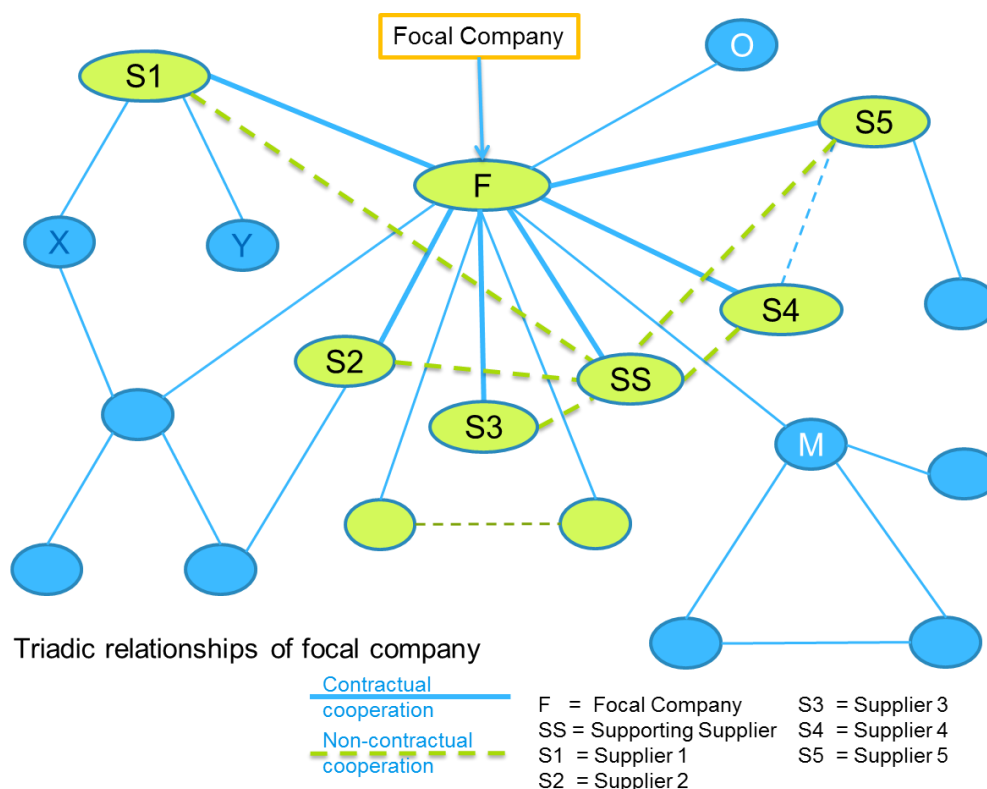


Figure 19. Triads in supply network.

Here these five triads are formed: F-SS-S_x, S_x ∈ {S1, S2, S3, S4, S5}

One actor of each triad is the focal company's counterparty for the supplier S_x. The number of the counterparty people and their positions vary in each function. Supplier SS is involved in required supporting role in each triad. SS provides supporting services in order to enable the S_xs perform the tasks assigned to them.

Suppliers have non-contractual (loose/voluntary) relationship for mutual cooperation for triad's good. This kind of voluntary cooperation may require some kind of contractual agreement or something a like at startup phase in order to evolve up to the voluntary based non-contractual cooperation later on.

4.4. Data collection and analysis

Survey was selected as the principal method for empirical data collection. Prior to the survey the briefing package of triad was created and dispatched to interviewees. The interviews for the persons involved in the case study were held and recorded during the survey. Twelve interviews were held in overall during the case study. Six interviews were held for the focal company representatives from the functions selected for the case study. The counterparty interviews for the representatives from six subcontractors were held respectively. The duration of an interview was about two hours. The interviews

were transcribed from the voice recorder recordings. Twelve separate data sheets were created from the transcriptions and interview notes accordingly.

The interviewees were selected by the focal company based on the business prospects and availability on the date of interviews. Interviewees represent the organizations that are supposed to cooperate in triads. Interviewees are in charge of activities in a certain function or the whole business of the company. The workers interviews were left out to limit time of the study and amount of effort needed in order to fit study into time frame of assignment. The study is mainly done from management point of view.

The substance of interview questions relates to the relational properties of relationship. Some of the questions were asked to be answered by giving the numerical value estimate for a feature in question as it is currently and target to be pursued. The rest of questions were open and were answered informally. Some guidance was given when necessary. The main purpose of the questionnaire was to find out the state of the relational properties among actors. (See Appendix A for more details of the questionnaire.)

Survey results measured on numerical scale (e.g. from 0 to 5) were tabulated in and analyzed with spread sheet application. Minimum and maximum values were found and average values calculated. The gap between the current and target states of relational properties indicates a tension for change and desired direction to proceed. Each measure partly reveals actors' attitude and practice in relations and thus indicates actors' readiness to form and develop triad business relationship and practice. Interpreting and analyzing the free-form answers of the questionnaire revealed some prevailing assumptions and practices which are quite interesting from triadic cooperation point of view as well.

4.5. Validity and reliability of results

Construct validity identifies correct operational measures for the concepts being studied. *Internal validity* seeks to establish a causal relationship, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships. *External validity* defines the domain to which a study's findings can be generalized. *Reliability* demonstrates that the operations of a study – such as the data collection procedures – can be repeated, with the same results.

For construct validity the operational measures for the relational concepts in this case study were identified from literature based on relational aspects. The references are in Table 2. Construct validity and reliability of the study can be enhanced using multiple sources of evidence (Yin 2009). In this study were involved twelve different source organizations in total. The total number of interviewees was fourteen. Internal validity

was tried to confirm by asking the same questions from opposite party as well. This also worked as a sort of confirmation to reliability since deviations in results were minor or none.

It is known that people vary in the way they respond to questions. Some people tend to use the extreme ends of response scales, whereas others tend to center their answers to mid-points. Transient personal factors such as mood may also have an influence on responses. (Ghauri & Grønhaug 2010) The effect of the previous factors is difficult to avoid. The situational factors were tried to prevent by allocating the same amount of time, space and refreshments for interviews. At the beginning of each interview, the triad context was clarified. So the orientation and framework for personal interview were equal. Unclear terms and issues were explained when required during the interview.

The findings cannot be generalized outside of the case context, but on the other hand at least some results are likely in line with potential findings in another similar supply network of large construction project. Most of the actors are serving in similar projects elsewhere as well. The interviewees found plenty of commonalities in the area of project business in question.

5. RESULTS

Results of the survey for the measured relational properties are presented in the following tables. In table 5 average values of the measures for trust, commitment, collaboration and relational behavior are given as the focal company side evaluates the suppliers and vice versa, how the suppliers evaluate the supporting supplier as a triad actor, and total average in the separate columns of the table. **Error! Not a valid link.** The estimated values are close to a very good level (4) in overall. Minimum value is shown in red cell and maximum value in green cell. F stands for the focal company and S for a supplier. Value estimate for relational behavior is the average value from the measures of relational initiativeness, informing the other about changes, confidentiality kept, perceived attraction on firm-level, personal chemistry match and total satisfaction. Separate estimates for each can be found in the result sheet in Appendix B.

Table 6 shows the given target values for estimated relational properties respectively.

Table 5. Target values for relational properties.

Average level on scale 0-5 (poor - excellent)				
Relational properties	Focal company to Ss	Suppliers to Focal company	Suppliers to SS supplier	F+Ss in average
Trust	4.67	4.50	4.00	4.39
Commitment	3.67	4.83	4.00	4.17
Collaboration	4.67	4.67	3.90	4.41
Relational behavior	4.27	4.47	3.73	4.16

The target values are about 0.5 higher (0.56, 0.30, 0.51 and 0.52) in average.

Table 7 shows estimated values for adaptation required and subjection forced in supplier's position. F-S is the focal company's and S-F is suppliers' average estimate.

Table 6. Current average values for the relational property Power.

Power	Adaptation (required)		Subjection (forced)	
on scale: low(0) - high(5)	current	target	current	target
F-S Avg	4.00	4.00	2.20	2.03
S-F Avg	3.83	3.33	1.37	0.42

Focal company doesn't see need for major changes in these values, while the suppliers in average would like to reduce adaptation by 0.5 and subjection by 0.95.

All relational properties in Tables 5-7 are at least very close to good level (3) when taking into account the reverse scale of subjection e.g. $5.0 - 2.2 = 2.8$, which is relatively the lowest (weakest) average value among all relational properties and indispensable adaptation is not on either extreme ends of the scale. An assumption is that these relational properties are not preventing the formation of triads. Perhaps the subjection may have hindering effect on forming and developing triad. Next, the results and statements for relational properties are given one by one based on the interviewees' opinion during the survey and author's assessments.

Trust

Suppliers trust each other and the focal company. Level of trust is high in overall (see Table 8). Arrow points to the object of trust and the evaluator is on top of the column. F stands for the focal company and S for supplier. Each has estimated the current and target values of trust.

Table 7. Average level of trust between triad actors.

Level of Trust				
<i>low(0) - high(5)</i>	F current	target	S current	target
F->S Avg	4,17	4,67	4,33	4,83
S->F Avg	3,33	4,33	3,83	4,50
Sx->SS Avg	3,20	3,50	3,50	4,00

In order to close the gap of trust for the potential target some measures should be taken to obtain 0.5 increase in average in level of trust between triad actors. Actors cannot see any obstacle that would make the target impossible.

Trust is like a foundation on which the rest of social capital is built. The more robust the foundation of trust is, the better it withstands the internal and external forces. In the case study context, the foundation of trust is solid enough for forming and developing triad business relationships.

Trust has been built on the previous experiences, in many cases cooperation has continued over very long period of time. It is recognized as cognition-based trust, which is mostly based on perceived consistent behavior and good personal relationships. "Trust is based on good personal relations between the people with whom we have worked in previous projects." In some cases trust is in part affect-based trust which in the case context is mostly based on the indirect focal company's customer evaluation.

“Well, supplier-supplier trust is largely based on the personal relationships, any mutual obligations do not exist”.

Reputation of organizations and counterparty people were evaluated to be good in average. Some communication difficulties have been with workers who do not manage the common language. This has had slightly reducing effect on trust. In these cases workers' supervisor has been required as an interpreter to resolve the situation. Trust has been earned by actions, good performance and work well done. The previous good experiences of cooperation in projects increase confidence. Principal does not control work too much which is interpreted as a sign of trust.

Commitment

Level of commitment is high in the contractual relationships while not seen that applicable in non-contractual relationships. Commitment was seen more as kind of contractual issue than an inherent ingredient of business relationship and long-term objective of doing business together. Suppliers stated that supplier-supplier commitment without contract is vague. Some short of positive cash flow as a result is required for real supplier-supplier cooperation.

Table 9 shows that in average the target level of commitment is about 0.6 higher, so there is some growth potential in commitment, especially in the supplier-supplier relationships.

Table 8. Average level of commitment between triad actors.

Commitment				
<i>low(0) - high(5)</i>	F current	target	S current	target
F->S Avg	3,50	3,67	3,50	4,67
S->F Avg	3,83	4,67	4,50	4,83
Sx->SS Avg	3,00	4,00	3,60	4,00

Relation specific investments were not very common excluding Health, Safety, and the Environment (HSE) matters required in the field of business in question. Clearly some relation specific investments were held back for large enough contracts and repayment prospects due to significant amount of money required in these investments. Preparing for unconventional requirements and more sophisticated technology (in advance) is expensive.

Both the attitude and motivation levels in performing tasks were very good (4) in average. Some improvement here was expected from SS at operational level. All parties said to aim for a long-term business relationship and were slightly more willingness for cooperation in the future based on the earlier experiences at projects. Suppliers make

efforts and are committed for long-term cooperation to develop business together with the focal company. Suppliers are still willing to increase commitment to the focal company and would like to see the focal company to increase its commitment to the case suppliers respectively.

Commitment to a new actor evolves during the project. Usually it is low at starting point. Suppliers demonstrate commitment by quality work well done on time. In current situation, the commitment between suppliers excluding supplier SS does not exist in most of the cases. An exception is between suppliers which cooperate also elsewhere.

Collaboration

Collaboration was evaluated to be easy with value of 3.8 in average. There is room for improvement though, especially between the suppliers as the target values indicate (see Table 10). The growth potential for collaboration is 0.55 in average.

Table 9. Average estimates for collaboration.

Collaboration			
<i>low(0) - high(5)</i>	easiness	target	importance in future
F-S Avg	4,17	4,67	4,67
S-F Avg	4,33	4,67	4,67
Sx-SS Avg	3,20	3,90	3,40
Average	3,77	4,32	4,09

Communication at operational level is open and informal. Confidential matters are treated as such. Suppliers consider that information exchange with the focal company is adequate, but inadequate between suppliers instead.

Objectives are set by the focal company and suppliers do their best to fulfill the requests and perform tasks assigned to them. The extent of collaboration has been more or less at the same level or slightly increased over the projects. Collaboration has been experienced improving in long run. Suppliers have willingness and capability to more autonomous and self-directing way of working, but this would preferably require larger contracts as well.

According to few actors, opportunism may occur at contract phase, but it has not been observed during the project. Conflict situations are quite rare and the few are usually resolved in meetings. Potential conflict situations arise when deviation in service order, timing or content occur. More detailed schedules for support services are on the suppliers' wish list.

There are familiar people among actors, often with common work history which helps in collaboration. Several representatives have worked in both sides – in focal company and subcontractor. These inherited familiar human relations seem to be remarkably helpful and make things easy deal with in the present cooperation.

Evaluation of supplier Sx-supplier SS collaboration is based quite often on the received feedback from the workers at field. “I haven’t heard anything negative, so it must have worked well”. The importance of supporting supplier SS varied among other suppliers greatly. While one thought highly of the cooperation the other didn’t see any need for the cooperation with supplier SS.

Relational behavior

Personal and social characteristics can have both conducive and restrictive effect on doing business with triad actors, the focal company and its suppliers. Personal chemistry match facilitates collaboration and mismatch makes it more complicated.

Suppliers aim to be proactive. They take the initiative in finding out customer’s needs and requirements, and sometimes also provide development ideas in addition to participating in the development meetings.

The extent of supplier-supplier interactions across different functional departments (lateral involvement) was evaluated to be at level 2.2 and across different hierarchical levels (vertical involvement) at level 1.3 on the same scale low (0) - high (5) as in all relational behavior measures. The target levels are 0.5 and 0.3 higher, respectively. Clearly the suppliers are not cooperating much in the current dyadic business relationship model.

The extent of supplier-buyer interactions across different functional departments (horizontal involvement) was evaluated to be about 3.8 and across different hierarchical levels (vertical involvement) about 2.5. The target values are about 0.7 and 0.8 higher, respectively. As can be expected the supplier-buyer involvement is relatively high in the dyadic business relationship. At the operational level, the involvement is above the good level (3) whereas at the business level it is below it. At the project level in planning and scheduling phase these values (not measured as such) would likely be in between levels of these two mentioned management levels of a triad.

The bilateral contacts at top management level of suppliers were very few or almost not at all. Some was considering it as an act behind back of the buyer and it would be open to question. Supplier Sx-supplier SS communication is at low level 2.2 (horizontal) and 1.3 (vertical) in average. Communication happens mostly at the operational level in connection with the common daily tasks.

Suppliers' initiativeness in average was estimated to be 3.3 and the target value 4.1, respectively. Even though the estimated value is good, here is still room for improvement in proactivity and initiative taking as 0.8 higher target value points it out.

Attraction to triad companies and personal chemistry match respectively were both estimated to be in average 3.6 and 4.1 as the target value. As the values are greater than good (3), neither of these should be a preventive issue in triad forming, likely quite opposite, particularly as the minimum given individual value was good (3).

Confidential and sensitive information in overall is dealt with very high mutual expectations as the average estimated value 4.7 points it out. Confidentiality is maintained properly.

Total satisfaction in the triadic relationships at the company level was estimated in average to be 3.7 and 4.4 as the target value. This is an encouraging finding for triad forming as well. See Appendix B for more about given estimates for relational behavior.

Power and responsibility

Supplier takes responsibility of its own work and gives support to co-supplier when necessary, but can't take responsibility of others' work. In non-contractual business relationship the actors are not in charge of each other's doings.

Most suppliers have competence and will to take care of increasing project management responsibility, but still want to leave coordination to the focal company. Coordination should be taken care of by the focal company. The reason is that the coordinator must have overall picture and enough power to make decisions. In overall the suppliers see the coordination as the biggest challenge in common project work.

According to the suppliers, the tasks assignment, order and responsible are clear and set by organization of the focal company. The focal company carries out the control and coordination of project tasks.

Inappropriate use of power was not perceived unless a case of underwent unfair periodization or deviation in order of support service work is counted. The focal company has power over suppliers. The suppliers' estimate for the required adaptation was at 3.9 and target at 3.7 in average. This result indicates that very high flexibility is required and has been achieved without great tensions.

Estimate for subjection, i.e. a supplier thinks that it has been forced to submit something unwanted, was 1.7 in average and target is naturally zero (in unitary triad). Here is a significant tension (gap) that might cause some prejudice and precautionary measures that may have explicit, a sort of preventive, impact on triad cooperation as well.

Slight bias towards rounding up is likely in given answers. In addition the positional difference in given estimated values was observed and it was in average about 0.3 higher for suppliers (i.e. $S(\text{estimated value}) \approx F(\text{estimated value}) + 0.3$). Statistical analysis was not done due to the small size of sample for statistical generalization.

Other features

The motivation type for the considered triads is clustering which helps in triad formation and development. Countering motives were not observed. Actors' bonds have been built up in number of common projects over the years. There is the common aim to strengthen bonds further. *Social distance* between actors in considered triads is small or does not exist because the actors know each other for long period of time in many cases. Previous cooperation has brought confidence and knowledge of others' way of thinking and working and therefore it is now easy to collaborate with the familiar actors.

The differences in organizational culture are mainly relating to the size and rigidity of organization and safety culture. Some cultural differences are inherited from the end customer. The values, norms and systems of the organizations are very similar. *Cultural distance* between the organizations is relatively small. The differences of norms and values occur in some extent between people from different cultures.

The products, services and production technologies of the suppliers are in line and suitable with the focal company, so in practice there is not significant *technological distance* between the case companies. Instead, fairly considerable *time distance* exists since in many cases the business under discussion may take place and generate cash flow quite far in the future.

There is interconnectedness between relationships, but some actors do not recognize it and the others cannot describe the effects clearly and in detail. Perhaps the thoughts were out of the triad to some extent due to the unspecified nature of the question (R8) for interconnectedness in general. However, the true interconnectedness within a triad could be finally revealed at work. Certainly, there is interconnectedness between triads too as the same supplier SS is involved in each triad.

The following supplier-supplier archetypes were found. A *conflicting* archetype in which one supplier didn't see any real reason for cooperation with supplier SS in this particular relationship, but prefers to cooperate with another supplier (*networking*) as they have interrelated tasks affecting the progress of both. The rest of the supplier-supplier archetypes are either *transacting* or *networking* depending on the respondent's (positional) viewpoint. The contractual supplier-supplier archetype is missing since there is no contractual relationship among the examined suppliers. Nor is any dog-fighting archetype present since the suppliers are not competing with each other.

The level of hierarchy at which collaboration takes place between the organizations does matter. The intensity and quality of relational behavior varies on the different levels of hierarchy. The frequency of interactions seems to decrease from bottom level to top level while the formality of exchange increases accordingly. Hence triadic collaboration is likely forming and developing somewhat differently on the different hierarchy levels of organizations partly due to the business perspective and focus on the level in question and interaction frequency. This has a significant impact on triad governance as well.

Governance in triad

Current governance mechanism is lead governance and it is based on network management through formal contracts by lead organization. From the strategy point of view the price and authority governance mechanisms are used. Social governance mechanism is mainly unutilized. The latter has its place and potential in triadic business practice, which in an advanced state enables lightweight social governance utilization alone. Currently social structure is not closed since there is structural a hole between suppliers as in the type I triad case. In the survey, the following governance levels were recognized for triad: 1) business/contractual level, 2) project control level and 3) operational level. On each level, the triad type, role of actors, strength of relationship and duration vary.

Other notes and findings

Some of other notes and findings in the interviews are in the following lists in no particular order.

A few enablers for supplier-supplier cooperation proposed by suppliers:

1. Turn-key contract would increase cooperation between suppliers involved in that subproject.
2. Supplier-supplier cooperation requires a piecework agreement since in the hourly rate framework it will not come true.

Suppliers' 'wish list':

- There is high seasonal variation in utilization of suppliers' resources. Instead, suppliers want from one off project mode to long-term continuous collaboration i.e. the focal company should also offer some (smaller) projects during transitional period in order to make sense to invest and put extra effort into the relationship by supplier. Here a frame agreement could be applied for example.

It would be a great help also in triad development when already known counter actors could make long-term relationship specific investments as well.

- More detailed schedules for support services are requested. Better visibility for coming service activities is needed in order to get planned tasks performed in proper manner on time without annoying waiting time(s).
- Actors would like to meet at the same table to agree the common and triad rules and get to know each other before the project work starts.
- Planning and installation teams from different organizations could have more cooperation with each other.

Some things and comments said in the interviews:

- “Supplier SS does not relate to us (Sy) by any means”
- Triads should be set up case by case, since the configuration and needs vary
- When an actor is replaced it means that everything including relationship building has to be started from the beginning, from zero in the worst case.
- Supplier SS sees other suppliers as equals. Replacement of any supplier does not matter to supplier SS.
- There is this kind of triad (type II) elsewhere in which a surveyed supplier buys services from another supplier i.e. the pursued supplier-supplier cooperation and self-directedness exist in the triad. So a considered type of triad works in similar business environment.
- Suppliers have cooperated with a maintenance and works service supplier directly without mediator of the focal company in the operations at plant. A sort of self-directedness takes place already in small scale.
- End customer’s requirements might be too challenging for small companies, e.g. having certain certificates or meeting the strict documentation requirements. Preliminary study phase can be quite a burden already not to mention the large amount of documentation to be carried out in the implementation phase. To carry out the documentation tasks by itself would mean that supplier had to hire the dedicated staff to do it.
- The procurement of goods and materials done by the focal company (by utilizing the economy of scale) is mostly seen as good custom, though some suppliers are

ready to take a bigger independent role and tasks and purchase the materials themselves as well.

Improving the working practices:

- “Working methods inside and outside of the focal company’s production plant are sometimes different”. Compare and adopt the best practice.
- “In the beginning there was change resistance for new ideas and ways of working, but in generally the customer has been happy for those reforms got through and the related cost savings”. Utilize continuous improvement and learning processes.
- Many suppliers have possibility to utilize leased manpower (from abroad) and it has been used increasingly. This seems to have its impact on some “communication problems related to the missing common language” (eng) skills of some foreign workers.
- There are a few ‘territorial’ anomalies which might mix a bit the views of some parties. Some suppliers’ employees work under supervision of the focal company as local staff. A supplier’s supervisor works as supervisor of a focal company team which consists of both the focal company’s and subcontractors’ employees. Making simpler and clearer organization structure (per function and area of responsibility) could help in resource management and task coordination as well as in increasing the efficiency.

All companies in case study are important as a supplier or a customer and have good reputation in fulfilling agreements. Thus, the companies are not reluctant to partner with each other. Some suppliers are small relative to the focal company, but are still able to meet the demand by flexibility in acquiring required extra resources on demand. Partnership relation would unite triad actors and create better circumstances for shared innovations. Sufficient relational orientation is required to engage in partnering relationship. Perhaps, actions for change in some of inhibitive company policies, transaction-based reward systems, rigid organizational structure and restricted flows of communication are still required.

6. CONCLUSIONS AND DISCUSSION

The objectives and findings of thesis are reviewed briefly in this chapter. Answers to the research questions are given, related conclusions are made and a few proposals for further actions and options of triad business practice are provided. Finally, the suggestions for future research are proposed.

The essential relational factors of the study are shown in Figure 21 as cohesive forces among the actors in triad. When these factors are in place in positive and constructive way, the commonly shared view of triad is possible and consequently triad forming and developing can be started by mutual consent.

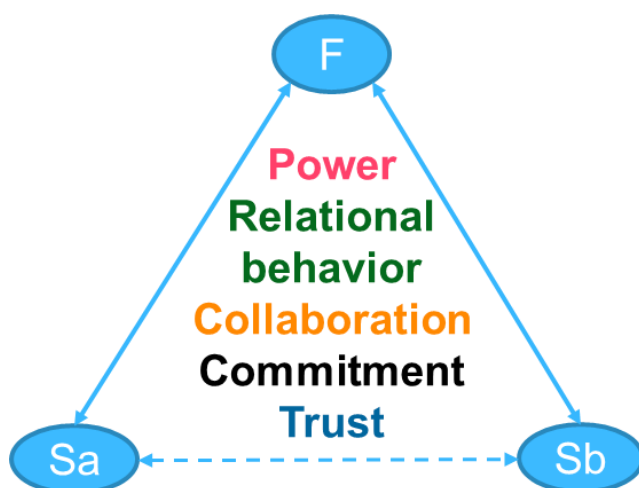


Figure 20. Relational properties as the foundation for the case triad.

When the estimates for the relational properties are on good enough level the relational cohesion supports triad formation and makes it more likely since the firm foundation, a requirement for successful long-term cooperation, is already in place. It also helps to make and carry out the common plans for shared objectives. Shared visions, values and norms strive actors to utilize continuous learning and improvement methods better together for triad's good.

It is not possible to give one and only correct answer to qualitative assessment of relational issues that are based on the opinions of individuals. In spite of this, the answers to the research questions of the study are given next.

MRQ: What are the conditions for forming and developing a triad in the case study context?

Based on the survey results the conditions are good for forming and developing triads. There is no major impediment to triads. An issue needs to be solved is the earnings principle that is clear and acceptable for all actors. A sort of mutual written agreement of compensations for supplier-supplier cooperation would supplement the triad framework and rules. An option is trilateral agreement. An observation from interviews was that some kind of contractual agreement is required in order to get the real commitment between suppliers. Relational factors affect circumstances in triads. Effects are explained in the next answer to SRQ1.

SRQ1: How do the relational factors affect the current relationship of actors involved in the considered buyer-supplier-supplier triads?

Collaboration is easier when relational factors like trust and commitment are at a good (3) or better level as they are already or could be in the case relationships. Currently relational properties are helping in well-functioning cooperation especially in the buyer-supplier relationship. Buyer's commitment to supplier is not as strong as vice versa. This is obviously due to the buyer's aim to invite supplier to tender in order to get the best offer. Supplier-supplier collaboration hardly exists in the current non-contractual relationship, but trust and readiness to commit are good for triad cooperation. Relational behavior is good in overall. Business-related constraints and rules are complied with, companies and personnel are compatible with each other so well that total satisfaction in relationships (3.7) is almost at very good level (4) in average. Power is used sometimes in a way that suppliers think that they have been forced to do something unwanted. This is something that may hinder triad cooperation and needs to be solved.

SRQ2: What are the challenges and opportunities to form and develop a triad in case study context?

Some opportunities and challenges in forming and developing triad based on the conclusions and findings from interview discussions are listed next.

Things that help in triad formation and development:

1. Actors trust each other
"Without trust, the cooperation would not have continued for this long."
2. Actors are committed to each other
"We have made concrete efforts to develop our common business together."

3. Actors are familiar with each other which helps in collaboration
“We know each other, which makes collaboration easy.”
4. The motivation type for the considered triad is clustering
“Willingness to cooperate has increased during the previous projects”
5. Congruent organizational culture, shared norms and values
“We have had some problems with nondomestic actors ...”
6. Shared visions and common interests
“At the beginning of project should be a meeting in which all actors get information about the project and shared objectives.”

All the points in the list above are valid in the studied relationships. Perhaps, the shared visions and common interests need to be clarified and stronger applied in practice for getting the greater sense of cohesion and community among actors in triads.

Things that are likely to hinder the formation and/or development of triad.

1. The actors do not get along with each other
2. Abuse of power
3. Contractual issues pose obstacles
4. Management support is missing
5. Disruptive organizational changes
6. Maintenance of social capital is neglected

In list above the points 2 and 3 require attention and some actions for getting well-functioning cooperation come true with actors in triads. Top management's support for triads was not measured. Top management's unwavering support is a vital part of realization of triads. All six issues need to be monitored constantly in order to be vigilant and able to eliminate related risks.

SRQ3: How can the circumstances for triad forming and developing be improved?

1. Pay attention to the starting procedures. At the beginning or even a bit earlier of the new project all actors involved should meet at the same table to agree the common and triad rules and get to know each other.
2. Consider and set up triads case by case, since the configuration and needs vary.

3. Arrange common planning sessions. Planning and installation teams from different organizations could have more cooperation with each other.
4. Define earnings principles. Suppliers state that supplier-supplier commitment without contract is vague. Some sort of cash receipt is required for cooperation to be established in the case supply network.

If the actors do not get along with each other well enough for one reason or another, it may be a reflection of poor relational properties that are at inadequate level for well-functioning cooperation. Corrective actions are required until well-functioning cooperation is achieved. Replacement of an actor is an option if nothing else helps. However, this should be considered as a last resort, since the building of the new good relationships may take much time unless the actors know each other well enough.

Based on the survey observations and analysis the triad governance aspect can be divided into three different management levels: business, project and operational. It depends on the project phase which one is emphasized. At the contract phase business management level governance takes place and it usually means structural hole situation in triad when negotiating and agreeing the separate dyadic contracts. Project management governance comes from project organization, plans and scheduling. The project schedule has tendency to change for number of reasons during the project and this causes deviations from the project plan, which in turn lead to some corrective actions in operations. Operational level governance takes place during the manufacturing and assembly phases with concurrent change requests from project organization.

Options for triad formation at the operational level are depicted in Figure 21. The controllability, collaboration and self-directedness vary between these triad types.

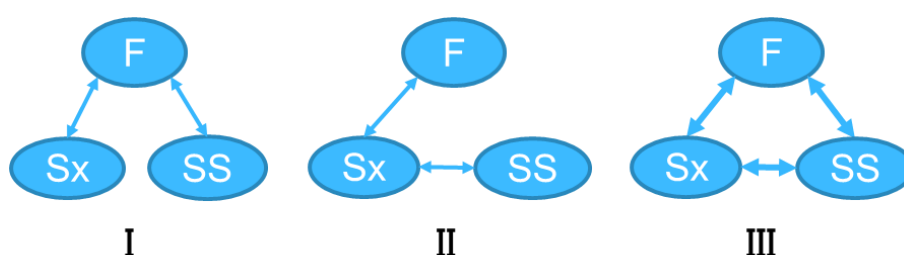


Figure 21. Operational level options of triad.

Type I triad is basically utilized already. The focal company has separate contracts with suppliers based on dyad relationships. The focal company acts as intermediary and mediates tasks, requests and information between suppliers. The focal company does not gain value by mediating the transactions of suppliers. Type II triad supports turn-key

contract with a supplier, which in turn has contract with the other supplier (contracting archetype). Here a large part of coordination tasks and responsibility have been transferred/outsourced to the supplier Sx. The focal company's controlling and monitoring tasks are substantially reduced. There is a structural hole in type II triad as well. Unity among actors can be achieved with type III unitary triad, in which each actor cooperates for the common goals and benefits with shared visions and objectives. Governance is based more on self-directedness than the lead actor's commands since all actors are equal by default. This also means that each actor is empowered to do what it is expected to do. A frame agreement and partnership strategy are possibilities to develop triadic relationships further.

The idea is to identify and get system-wide benefits in common collaboration and recognize that partner's benefit is actor's own benefit and vice versa. All actors are in the same boat, read the same charts, steer and row in the same direction commonly aimed for on the voyage to the known port of destination.

SRQ4: How can the considered triads be governed?

The lead organization governs in type I triad. This is much the same price and authority governance practice that is already in use. The lead supplier would take the major role in outsourced governance model as in type II triad providing turnkey solutions to the lead company by governed supplier(s). Shared governance would be a natural choice for type III transitive triad in which the more self-directing actors together administer the network. There is a trade-off between self-directedness (III) and controllability (I) from the lead company point of view. A separate administrative entity which governs the actors in triad would be a choice perhaps for a larger aggregate of triads which better fits for network governance. The administrative burden can be reduced in each case by utilizing social governance that relies on trust and sense of community. Larger amount of social capital paves the way for better network governance. The amount of social capital is up to the actors as is the deployed governance mechanism(s).

Closed structure in transitive and unitary type III triad would increase social capital as well as stability of social structure and relations. The forming of unitary triad gains social capital, which, however, requires continuous maintenance in order to remain productive and favorable for the future development.

The interviewees were in the various levels and roles of surveyed organizations, which on the one hand provided diversity in perspectives and opinions, but on the other hand made it difficult to find a common ground for analysis. Perspective of answers varied from supervisor to CEO in interviews and left more room for situational interpretations. On the other hand, this provided larger coverage of issues.

Results indicate a few areas that require development actions to be taken in order to make it easier to form well-functioning triad and triad business practices. Level of subjection should be reduced and the commitment and collaboration between suppliers increased. These improvements also affect trust positively. Triad types II and III promote collaboration between suppliers and thus they are proposed for trial in pilot projects.

All six suppliers are willing and able to learn new things and more about each other in order to obtain the benefits the triad offers. The large organizations that are more capable to adapt the considerable changes in demand for resources are eager to take bigger role and responsibility with the new larger turn-key contracts.

The objective of this study was to determine the state of relational properties for triad forming and developing. Selected research methods were appropriate for successful data collection. Even though the sample size is statistically too small for deriving the general conclusions from the results, the results are indicative enough in the focal company's supply network for the decision-making and further actions concerning the triadic network business practice development. Relational properties among actors in the considered triads were determined by the survey i.e. this objective was achieved.

This study concerned relational factors for triad forming and developing in the case company's business context. In order to see the relational properties effects on forming and developing the real triads, the piloting of triads with different initial values of relational properties would be needed. Continuous triad would be good at the piloting phase.

The possible positive consequences on performance, supplier-supplier cooperation, flexibility and cost savings remain to be seen in the pilot and later triad implementations. At least from the relational properties point of view these improvements can happen. Relationship quality measures were very good. Relational elements for triadic partnership exist. It is up to the actors to take the next step to form and develop triads in supply network. The triad concept can be utilized in the broader context of business network. The triads were seen as natural alternatives in resource management and in general between and within R&D organizations for example.

Parallel sourcing strategy for multiple parts and subassembly is an option to compare the price, delivery and quality across different suppliers (Cousins et al. 2008, pp. 55-57). As an option, there can be two triads, the same or different types, performing the same tasks in parallel and then the results of both are compared and evaluated for decisions making - what is the best structural setup of actors and operational practice in future.

The primary task of management is to get people to work together in a systematic way and accomplish change. Getting results is up to managers' ability to understand which

tools will work in a given situation. (Christensen et al. 2005) The financial incentives and strengthening the common vision are some issues to start with in forming and developing triadic cooperation.

To what extent the outsourcing is reasonable to realize by the customer to retain enough control over the whole project and still manage the whole business case properly depends much on how well triads are functioning and cooperating. How the set of triads can be well orchestrated is a matter of another study. Interconnectedness within and between triads could be studied better when triads are operating.

In the survey the different governance levels of triad were revealed, but more specific research for triadic actors from this perspective was not done. This could be a good focal issue for future research to find out dynamics and interdependencies of different triad governance levels. Considering the external interfaces of triad could be another future research area which was not much touched in this study.

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APPENDIX A: INTERVIEW QUESTIONS

Triad objectives (O) flexibility, good cooperation, tech. & economic benefits etc.

Function of the focal company + supplier SS + [supplier S1, S2, S3, S4, S5]

Backgrounds (B):

1. the size of company, domain, turnover, profitability
2. interviewee's role/position/task
3. cooperation organizations: primary customer/supplier/subcontractor, others
4. collaboration
 - a. how did it start?
 - b. duration (years, months)
 - c. based on project, annual or partnership contract?
 - d. times (pcs)

Relational properties for evaluating possibilities to cooperate in triad

Relational themes in survey: trust, commitment, collaboration, relational behavior and power

Trust (T)

1. Do suppliers trust each other and how does it appear?
2. Do suppliers trust to the buyer and how does it appear?
3. Has there been any reliability problems with the organization or personnel, what?
4. Describe the reputation of cooperation organization?
5. Describe the reputation of counterparty person in other organization?
6. What kind of experience and impression have been got from cooperation so far?
7. What is the basis of trust
 - A. affective
 - B. cognitive
 1. prediction of behavior (calculated),
 2. perceived consistent behavior (knowledge) or
 3. mutual understanding and common values (similarity)
8. Level of trust (1-5): poor(1), adequate(2), good(3), very good(4), excellent(5)
 - a) F - S
 - b) S - F
 - c) S -SS
 - d) SS - S
9. Is there reciprocity in the relationship, what kind?
10. Is there solidarity in the relationship, how does it occur?
11. How do the organizational culture and norms differ in organizations?
12. Does principal control work too little, enough or too much?

Commitment (Com)

1. Is supplier committed to the cooperation and common target of another supplier, how does it occur?
2. Are both parties aiming at the long-term collaborative relationship?
3. Are supplier committed to work together to achieve common objectives?
4. Have objectives accepted together?
5. Have relation specific investments been made? (e.g. equipment, training, certificates)
6. Level of commitment (1-5): poor - excellent.
 - a) F - S
 - b) S - F
 - c) S - SS
 - d) SS - S
7. Does supplier keep agreed schedules?
8. Estimate supplier's attitude (1-5) in task execution?
9. Estimate supplier's motivation (1-5) in task execution?
10. How has cooperation affected desire to cooperate in future (increased – decreased)?

Collaboration (Col)

1. Describe communication with counterparty
 - a) open?
 - b) confidential?
 - c) informal or formal?
 - d) frequency, regularity?
2. Describe communication between suppliers
3. Is there enough information exchange?
4. Have the objectives set together?
5. Which of the followings best describes the relationship: new, expanding, troublesome, static or lifeless?
6. How has collaborative relationship evolved over time?
7. How frequent are conflict situations (0-5) and how are them resolved?
8. Is there opportunism in relationships?
9. Does supplier have will and capability to more autonomous and self-directedness way of doing business?
10. How would you describe the short and long term flexibility of resources for changes in requirements and demand?
11. Do the counterparties have common social relations outside of business, what kind of e.g. hobbies etc.?
12. How well is the collaboration going? (1-5): poorly - excellently
13. How important is the collaboration in future? (1-5)

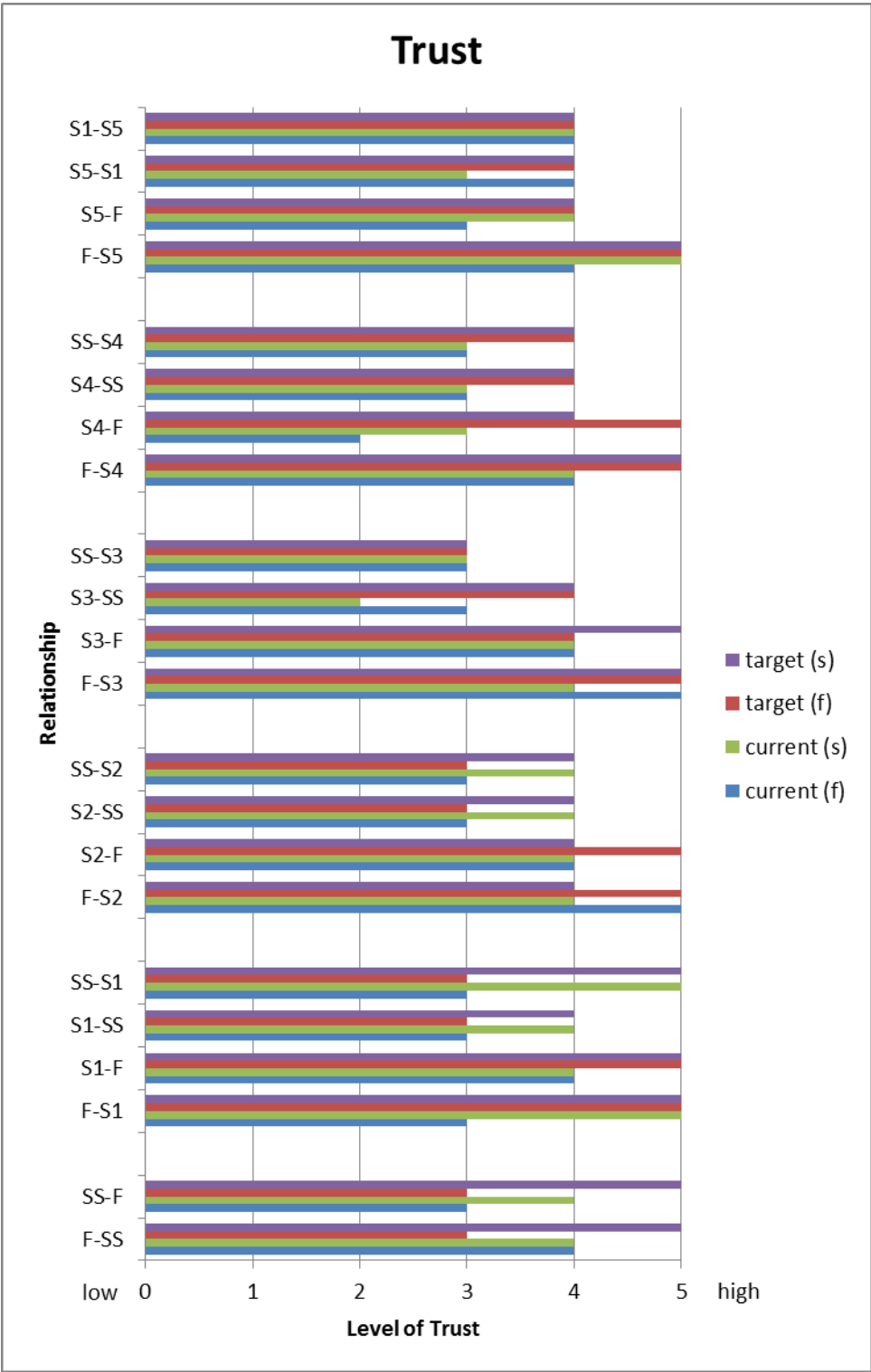
Relational behavior (R)

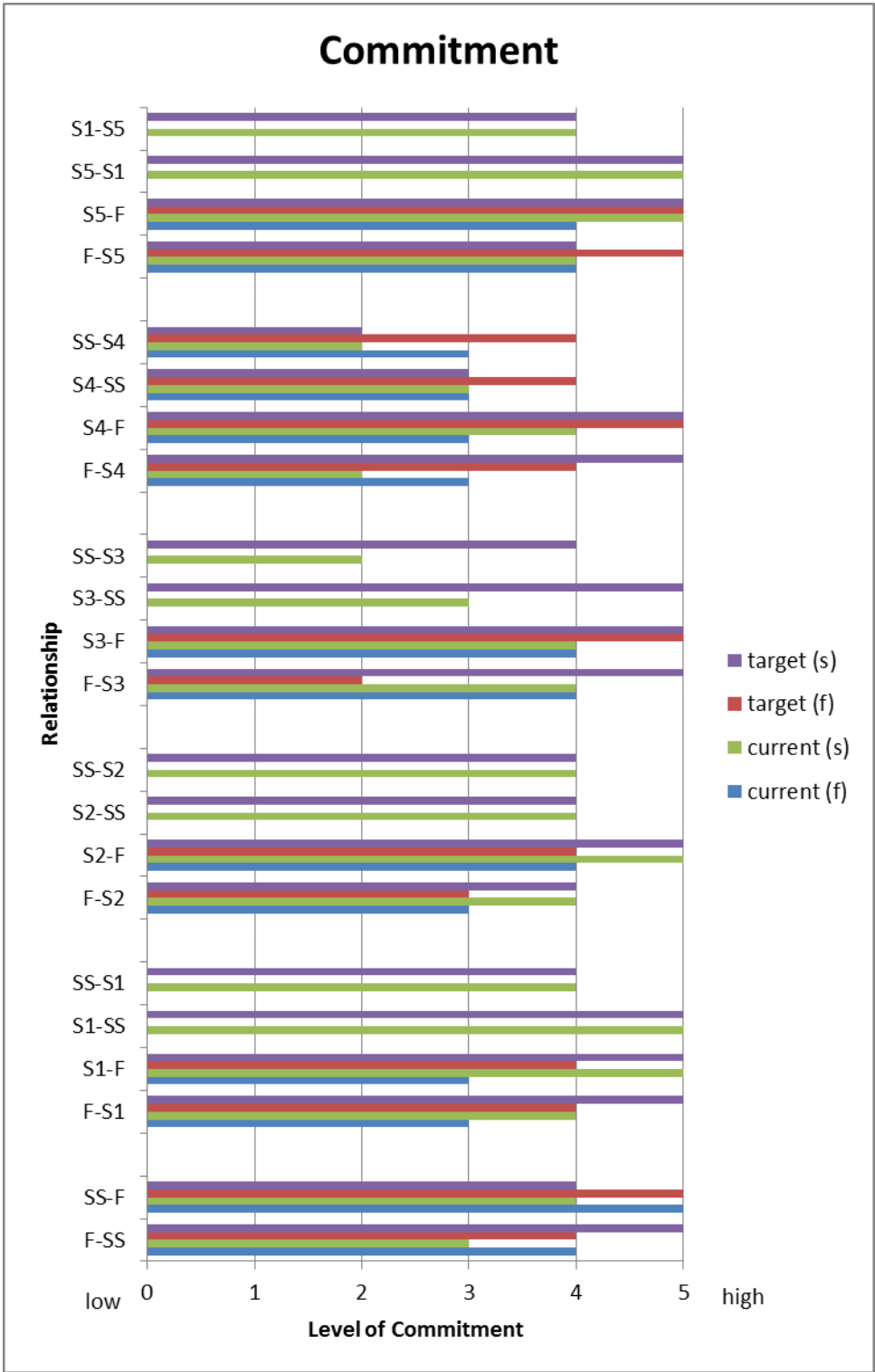
1. Do personal and social characteristics have conducive, none, or restrictive impact on doing business?
2. Is building and maintaining of personal relationships important (1-5)?
3. Does supplier act proactively to find needs and requirements of the customer and contribute to the competitiveness of the customer, how does it occur?
4. Do suppliers communicate horizontally with each other (0-5)?
5. Do suppliers communicate vertically with each other (0-5)?
6. To what extent, actor provides sensitive/confidential information about itself and is the information withheld from others?
7. Quality of relational behavior (0-5): Sx-F F-Sx Sx-SS/SS-Sx
 - a) initiativeness
 - b) advance notice of intended and impending changes
 - c) disclosure of sensitive information
 - d) attraction
 - (economic benefits, access to important resources and social compatibility)
 - e) personal chemistry match
 - f) total satisfaction
 - g) interaction frequency (times/week) and
 - h) richness (face-to-face, others)
8. How does another (what?) actor-actor relationship effect on cooperation in actor's own dyadic relationship?

Power and responsibility (P)

1. Does supplier take responsibility of its own and co-partner's work and how does it occur?
2. Does supplier have competence and will to take care of increasing project management responsibility?
3. Are the tasks assignment, order and responsibility clear to all actors?
4. Who coordinates the whole and how?
5. Has there been any abuse of power?
6. How much actor has been forced to adapt in cooperation (0-5)?
7. Has actor been forced to submit to demands (0-5)?
8. Can supplier be empowered to do work self-directly? How does it happen?
9. How is the suppliers' cooperation achieved?
10. What changes triadic business model causes in the current tasks and job descriptions (in the focal company) compared with the current dyadic business model?

APPENDIX B: MEASUREMENT RESULTS





		SS	S1	S2	S3	S4	S5	Average
Attitude	(current)	4	5	5	4	2	4	4.0
	(target)	5	5	5	4	4	4	4.5
Motivation	(current)	4	5	5	3	3	4	4.0
	(target)	5	5	5	4	4	4	4.5

